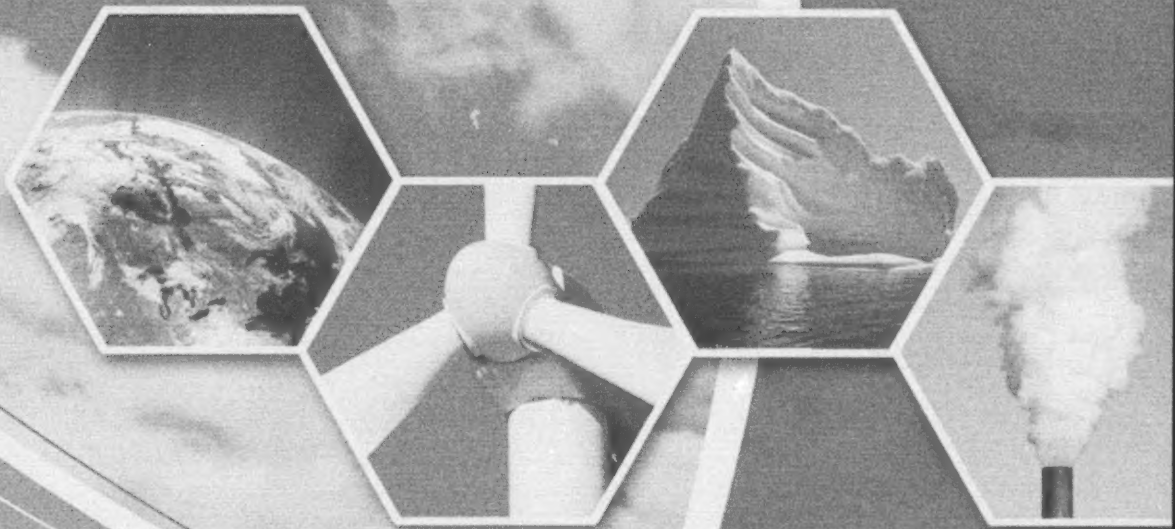
Charting our Course

Newfoundland Labrador



CLIMATE CHANGE ACTION PLAN 2011

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LETTER FROM THE PREMIER

Climate change is one of the greatest long-term challenges facing the world today. The science is clear and unambiguous: climate change is happening and requires a serious and sustained global response. Our government believes that Newfoundland and Labrador must be part of the solution and play its part in responding to climate change.

With great challenges come great opportunities. There will be increasing demand for cleaner energy as jurisdictions move to reduce their greenhouse gas emissions. Newfoundland and Labrador is well positioned to meet this demand. Our province has vast clean energy resources and our government is committed to utilizing revenues from our non-renewable resources to support a clean energy future. With the 3000 megawatt Lower Churchill development and our substantial wind resource, we can substantially reduce greenhouse gas emissions in our own province and further afield.

Our government is committed to positioning our economy so we are well placed to seize the opportunities associated with the move to a low-carbon global economy. The innovative wind-hydrogen-diesel technology being developed in Ramea has huge potential for remote communities around the world and our world-renowned expertise in ocean technologies can improve understanding about the impacts of climate change here and elsewhere. As well as innovative technologies, energy efficiency has an important role to play. Cost-effective ways of using less energy will help move us towards our greenhouse gas reduction goals, while simultaneously reducing fuel bills and enhancing competitiveness.

Efforts to reduce greenhouse gas emissions must of course go hand-in-hand with moves to adapt to unavoidable impacts of climate change. Newfoundland and Labrador's geography, economy, and culture have been shaped the sea, as such we will be affected by changes to the ocean, such as sea-level rise and coastal erosion. These and other impacts could affect forestry, agriculture, wildlife, the marine environment, infrastructure and our communities. We must ensure that we have the information and capacity needed to make the right decisions to manage these impacts and that we embrace new ways of thinking and planning so that our communities are more resilient and well prepared for the future.

The scale of the challenge is considerable. Success will depend on everyone playing their part to work together towards a common end. Our government is committed to pursuing a pathway that is both environmentally sound and economically prudent and providing leadership as we chart our course forward.

Sincerely,

Kathy Dunderdale

Kathy Dunderdale
Premier of Newfoundland and Labrador

LETTER FROM THE MINISTERS

Climate change is one of the most important issues facing Newfoundland and Labrador. It is an issue that will affect our environment and communities, but it also presents new opportunities for clean energy development, energy efficiency, the application of innovative technologies, and economic growth.

The Government of Newfoundland and Labrador is committed to taking action and *Charting our Course: Climate Change Action Plan 2011* sets our strategic directions for the next five years. Our commitments and targets are ambitious, but the importance of this issue to our province demands that we set a course for success and dedicate ourselves to pursuing it. This action plan is being released alongside a separate but complementary document on energy efficiency called *Moving Forward: Energy Efficiency Action Plan 2011*. This is in recognition of the fact that, in addition to being a key part of our efforts to reduce greenhouse gas emissions, energy efficiency has wider economic and social benefits.

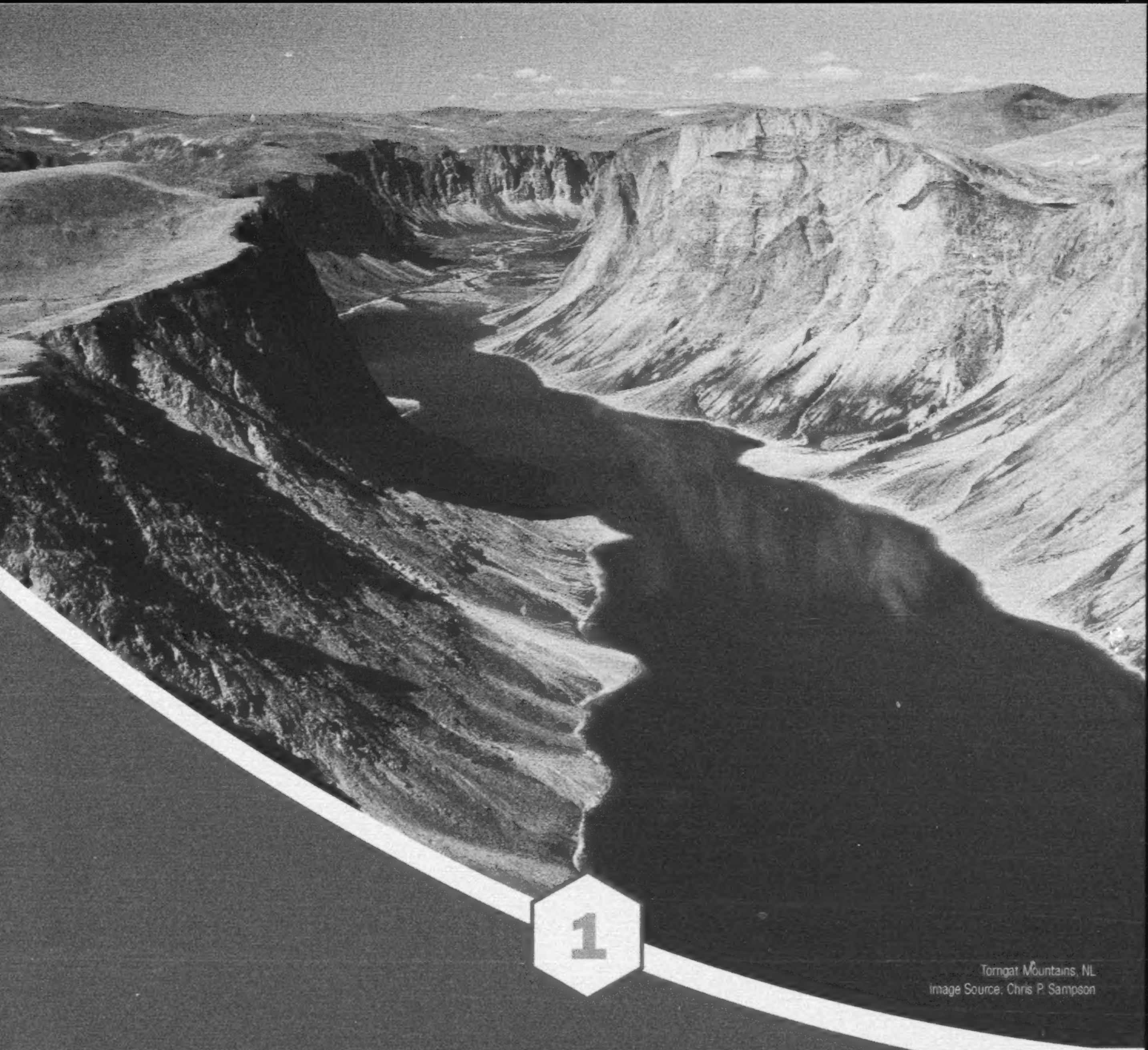
Both plans were developed with significant input from individuals and entities outside of government. In particular, the consultations on climate change and energy efficiency held in the spring of 2010 provided important insights and the input received was central to the development of this plan. The importance of future collaboration is a key guiding principle of this plan and our government is committed to working with other governments, industry, communities, researchers and other stakeholders as we take the next steps in responding to climate change.

Charting our Course: Climate Change Action Plan 2011 addresses the two key aspects of an effective response to climate change: adapting to the unavoidable impacts of climate change and reducing our greenhouse gas emissions to meet the targets we have committed to. Major weather events such as Hurricane Igor underscore both the need to better understand long-term changes in our climate and the importance of global action to mitigate greenhouse gas emissions to avoid worse impacts in future.

We begun our journey on climate change with previous strategies such as the 2005 Climate Change Action Plan and built on this foundation over time with targeted initiatives such as the Green Fund and, more recently, new investments in Budget 2011. We have made important progress, but more work remains. From how we work with industry to reduce their carbon footprint, to how we monitor changes in our climate and design our communities and infrastructure, there are untapped opportunities in Newfoundland and Labrador. To drive action across economic sectors, our government is committed to leading by example in the policies we establish and in the way we manage our own operations. Climate change is one of the most important issues facing our province and how we respond over the years and decades ahead will shape our economy, communities and broader society.

Sincerely,

Ross Wiseman	Shawn Skinner
Minister of Environment and Conservation	Minister of Natural Resources



Torngat Mountains, NL
Image Source: Chris P. Sampson

1

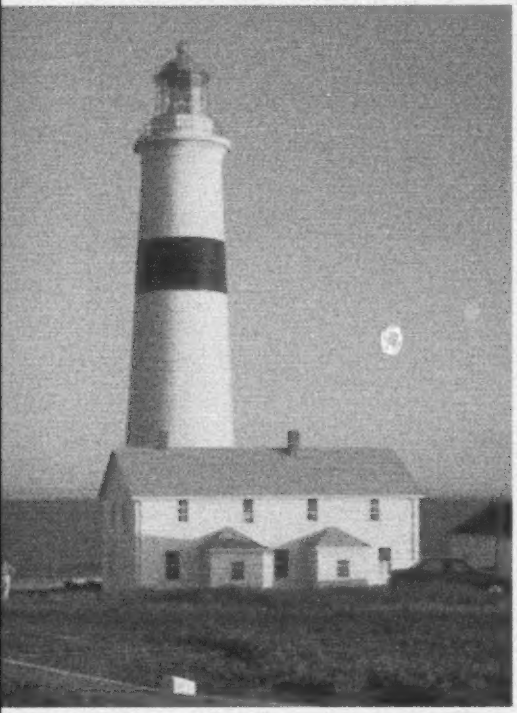
INTRODUCTION

Charting Our Course

1.0 INTRODUCTION – CHARTING OUR COURSE

The Government of Newfoundland and Labrador believes that climate change is one of the greatest long-term challenges facing the planet, and it is committed to fulfilling the province's potential to be a global leader in this area. Government recognizes that climate change is not just an environmental issue – it is equally an economic and social issue that can impact the province and present opportunities for job growth, innovation, and clean energy development.

This plan - Charting Our Course: Climate Change Action Plan 2011 - sets out the Provincial Government's commitment to action over the next five years. It establishes new directions supported by the latest science on climate change, lessons learned from other jurisdictions, and in-depth research on the challenges and opportunities associated with climate change in Newfoundland and Labrador. The release of this plan fulfills three government commitments: to update the 2005 Climate Change Action Plan, develop a Greenhouse Gas Strategy for the Energy-Intensive Sector, and prepare a Climate Change Adaptation Strategy for northern Labrador.



Point Amour Lighthouse, NL
Image Source: Department of Tourism, Culture and Recreation

This plan takes an economy and province-wide view in recognition of the shared nature of the challenge and the impacts that could affect many areas of the province. These new directions build on government's strong foundation for action on climate change established through its 2005 Climate Change Action Plan, 2007 Energy Plan, targeted programs such as the Green Fund, and extensive collaboration with other governments. These efforts illustrate government's balanced approach to promote economic growth while responding to climate change, with efforts ranging from clean energy development and energy efficiency programs to helping communities adapt to changing climatic conditions.

Few jurisdictions can match Newfoundland and Labrador's ability to support a low-carbon global economy. Newfoundland and Labrador has exceptional assets that can benefit regional, national and global efforts on climate change. These include existing clean energy exports totalling 27.4 terawatt hours in 2009, three wind energy projects including the innovative wind-hydrogen-diesel project in the off-grid community of Ramea, and the 3,000 megawatt Lower Churchill project.

The 2011 Climate Change Action Plan has been released with a companion document, Moving Forward: Energy Efficiency Action Plan 2011. Energy efficiency can make an important contribution to efforts to tackle climate change where it reduces dependency on carbon-intensive fuels. However, energy efficiency has a much wider set of benefits. It can reduce household fuel bills, enhance competitiveness, strengthen energy security, reduce local air contaminants, and free up more power to export to other jurisdictions. As a result, even if all power was generated from clean energy sources there would still be a strong economic rationale for encouraging greater energy efficiency. Given this, the province has decided to publish a separate but complementary action plan on energy efficiency. This fulfills another commitment from the 2007 Energy Plan.

As the following pages illustrate, the 2011 Climate Change Action Plan is comprehensive in nature with a view to: (1) meeting provincial and intergovernmental commitments on climate change; (2) utilizing the advice and contributions received during consultations on climate change and energy efficiency in the spring of 2010; and (3) building on the suite of actions already taken by government departments and agencies. This action plan and its commitments will be guided by an overarching vision, principles, goals and objectives.

Vision

A province that effectively integrates progressive action on climate change into its policy, planning and programs in a way that supports future economic, social and environmental success.

Guiding Principles

The following principles are the cornerstones for government's decision-making on climate change and they will guide the implementation of this plan.

- ***Promote province and economy-wide action***, recognizing the need for all sectors of the economy to play their part in tackling climate change.
- ***Identify and maximize opportunities***, such as the development of the province's clean energy resources, improving competitiveness, promoting energy efficiency and developing new technologies.
- ***Understand and minimize risk***, particularly those associated with the potential impacts of climate change including stronger storm surges, sea-level rise and reduced winter sea ice.
- ***Utilize a blend of policy instruments***, recognizing that effective action on climate change requires the use of multiple approaches ranging from information campaigns to regulation.
- ***Support collaboration and partnerships***, to utilize the experience and expertise that is readily available in the public, private, academic and non-governmental sectors in Newfoundland and Labrador.

Goals

The goals and objectives of this Climate Change Action Plan establish the overarching priorities of the Provincial Government on climate change. The actions contained in this plan are directed at achieving one or more of these goals.

Goal 1: Enhance Newfoundland and Labrador's resilience to the impacts of climate change

Objectives:

- Strengthen the understanding of the impacts of climate change on the province.
- Improve the integration of climate change adaptation into decision-making.

Goal 2: Reduce greenhouse gas emission levels in Newfoundland and Labrador

Objective: Pursue the greenhouse gas (GHG) reduction targets of the Conference of New England Governors and Eastern Canadian Premiers on a provincial basis: 10 per cent below 1990 levels by 2020 and 75-85 per cent below 2001 levels by 2050.

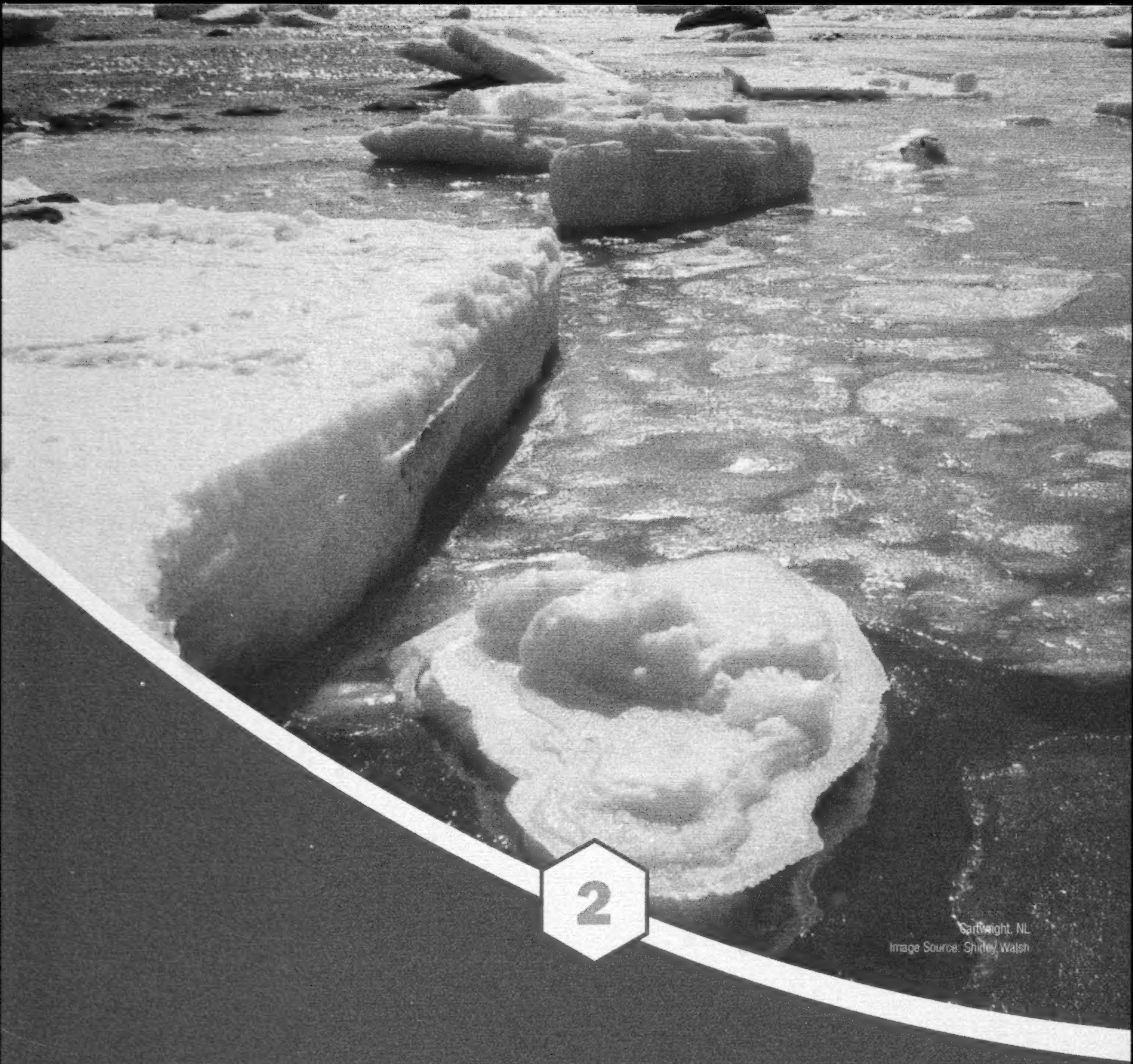
Goal 3: Demonstrate Provincial Government leadership on climate change

Objective: Promote economy-wide action on climate change through policies and measures designed to facilitate widespread engagement and action; and manage government's own operations in a manner consistent with this plan.

Goal 4: Advance action on climate change through collaboration with other governments

Objective: Proactively engage other governments to identify opportunities for collaboration on climate change.

The following pages will discuss the importance of responding to climate change and its relevance to Newfoundland and Labrador, and set out the actions government will take to meet the goals and objectives established in this plan.



Cartwright, NL
Image Source: Shirley Walsh

2

WHAT IS CLIMATE CHANGE?

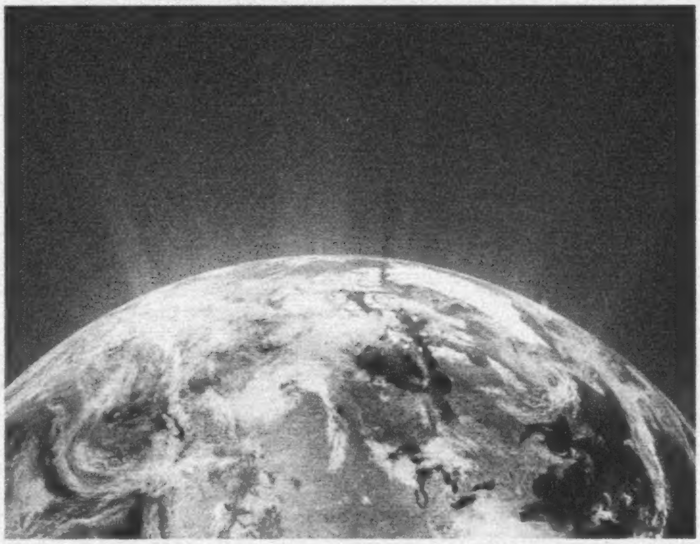
2.0 WHAT IS CLIMATE CHANGE?

2.1 Understanding the Challenge

A location's climate, which is defined by variables such as average temperature and precipitation, changes naturally from season-to-season and over time. Climate is closely connected to weather, which reflects the daily or hourly conditions of a location. Climates vary significantly across the globe and also within close geographic areas. In Newfoundland and Labrador, communities face very different climates from northern Labrador to eastern Newfoundland, and inland and coastal locations in between.

The international attention being paid to climate change does not focus on natural trends but rather the impact of human activity. Since the industrial revolution and the widespread use of the combustion engine, economic growth has been powered in large part by the use of fossil fuels such as coal and petroleum products. When these fuels are burned, be it to generate electricity or power vehicles, GHG emissions are released into the atmosphere and stay there for a very long time. These emissions include, among others, carbon dioxide, methane and nitrous oxide. At present, over 30 billion tonnes of GHGs are emitted globally each year by burning fossil fuels[1].

While the combustion of fossil fuels is one of the largest sources of GHG emissions on the planet and accounts for approximately 90 per cent of GHG emissions in Newfoundland and Labrador, the way that land and forests are managed is also important. An estimated 12 billion tonnes of GHG emissions are released globally every year from changes in land use[1]. For example, trees absorb carbon dioxide when they are growing, but release it after they are harvested, soils store carbon dioxide but can release it when disturbed, fertilizers contain nitrous oxide which is released during farming, and vegetation can emit methane in landfills when it decays without oxygen. While nitrous oxide and methane are emitted in much smaller amounts than carbon dioxide, they are 310 and 21 times more powerful than carbon dioxide in their ability to trap heat in the atmosphere, respectively.



As a result of these human activities, the rate with which GHG emissions are being emitted has reached levels unprecedented in the planet's history and the atmospheric concentration of carbon dioxide is now higher than at any time in at least the last 800,000 years. The levels of carbon dioxide, methane and nitrous oxide have risen significantly since the industrial revolution and the concentrations of these gases in the Earth's atmosphere is causing the planet to warm.

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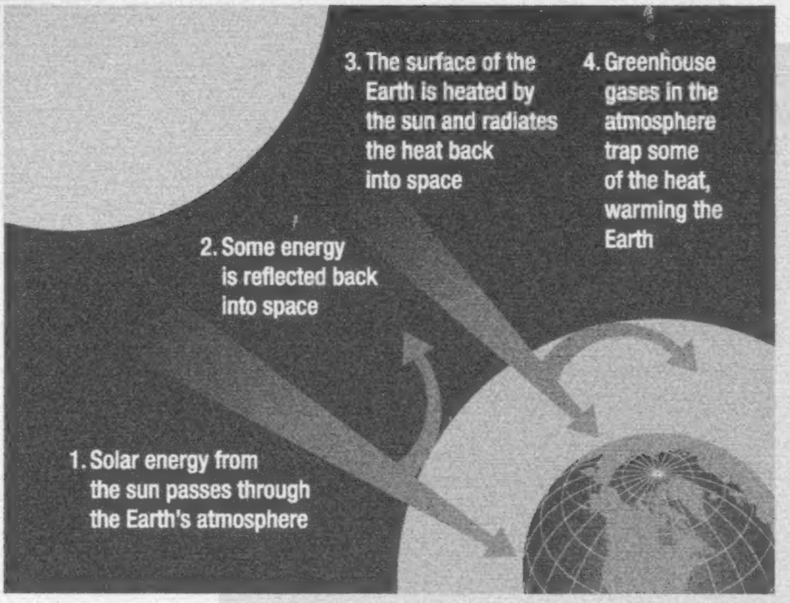
[1] Calculated from World Resources Institute figures.


1. Solar energy from the sun passes through the Earth's atmosphere
2. Some energy is reflected back into space
3. The surface of the Earth is heated by the sun and radiates the heat back into space
4. Greenhouse gases in the atmosphere trap some of the heat, warming the Earth

The Greenhouse Effect

Life on Earth is sustained by naturally occurring gases in the atmosphere which allow the sun's rays to pass through to warm the Earth, and then trap some of the warmth to prevent it from escaping out into space. This is known as the natural greenhouse effect and, without it, it would be too cold to support many of the life forms on Earth. Since the industrial revolution, human activities have rapidly increased the amount of GHGs emitted into the atmosphere.

These additional GHGs have thickened the blanket of gases surrounding the Earth, making it more difficult for the heat reflected off the Earth's surface to escape into space. This has caused the Earth's average surface temperature on land and in the sea to rise thereby affecting the complex web of systems that support life on Earth.

The Intergovernmental Panel on Climate Change is the global scientific authority on climate change science. It has concluded that climate change is happening, the planet is warming, and the release of GHG emissions from human activity is by far the most likely cause. It has found that the impacts of climate change are already evident, such as polar ice melt, sea-level rise and shifts in the timing of seasons.

Intergovernmental Panel on Climate Change (IPCC)

The IPCC, established in 1998 by the United Nations and the World Metrological Office, is considered the world's most authoritative voice on climate change science. The IPCC does not carry out research; rather, its findings are based on the assessment of existing peer-reviewed and published scientific and technical literature. Its most recent report (2007) was peer-reviewed by over 2500 experts from 130 countries.

In its 2007 report, the IPCC concluded that it is "unequivocal" that the planet is warming and there is over 90 per cent probability it is due to the release of GHG emissions from human activity. It estimated that temperatures could rise by between 1.1°C and 6.4°C by the end of the century, but the extent of warming will depend on the amount of GHGs emitted globally over the coming decades.

The IPCC found that the impacts of warming are now evident in many of the Earth's natural systems, both physical (such as melting glaciers and rising sea levels) and biological (such as the poleward shift in plant and animal ranges).

The next IPCC Assessment Report, due to be released in 2014, will provide an update of knowledge related to climate change.

2.2 Climate Change in Newfoundland and Labrador

Newfoundland and Labrador's weather is often unpredictable and at times volatile, but it is directly relevant to a number of important issues ranging from economic development and public safety to environmental sustainability. Daily weather forecasts help fish harvesters determine the best time to go to sea or return from it, governments in their delivery of public services such as transportation, and emergency response personnel in their planning and response to extreme weather events such as flooding. Equally, the study of climate trends over time supports the safe design of roads, bridges, and offshore oil and gas platforms, municipal and regional land use planning, and long-term power supply and demand management.

Climate change is an important issue for Newfoundland and Labrador. As a large coastal province with over 90 per cent of the population living near the sea, Newfoundland and Labrador is exposed to many long-term impacts of climate change including sea-level rise, more storm surges, greater coastal erosion and volatile changes in seasonal weather patterns. These have important social and economic implications:

- Storm surges and flooding can affect infrastructure, services, and business activity, as seen with Hurricane Igor.
- Coastal erosion and sea-level rise can impact community development and place homes, businesses and coastal infrastructure at risk, such as wharves and causeways.
- Changes in seasonal weather patterns can affect energy demand and supply, along with the agricultural and forestry growing seasons.
- Changes in the ocean environment can affect fish species, vessels and shipping, ice conditions, as well as the site-selection and long-term sustainability of aquaculture farms.

One of the most dramatic and potential costly impacts of climate change will be more extreme weather. Climate change is expected to result in warmer weather with an increase in total precipitation falling in fewer, but more intense, events. Increases in precipitation, especially the *intensity* of precipitation, could impact local infrastructure which is critical to ensuring that services such as health care and education can be provided without disruption. At the same time, changes in winter snow conditions or periods without rain may impact run-off and overall water quality.

Although no single incident can be attributed to climate change, the recent experience of Hurricane Igor underlines the need to understand and prepare for changing environmental conditions. This destructive event, which is estimated by Environment Canada to be unmatched in the province's recent history, caused an estimated $150 million in damages and, at its peak, cut off 150 communities from transportation infrastructure and affected electricity to an estimated 70,000 people. Hurricane Igor reshaped the natural environment and at the same time destroyed roads, homes and buildings, and directly impacted countless residents around the province.

Hurricane Igor – September 2010

Lady Cove
Image Source: Wayne March

Lawn
Image Source: Craig Paisley/CBC

Port Union, NL
Image Source: Christina Eddy

2.3 *Taking Action*

Responding to climate change is a complex challenge that has two equally important components: (1) adapting to the unavoidable impacts of climate change and (2) reducing GHG emissions to limit or avoid the potential impacts of climate change in the future.

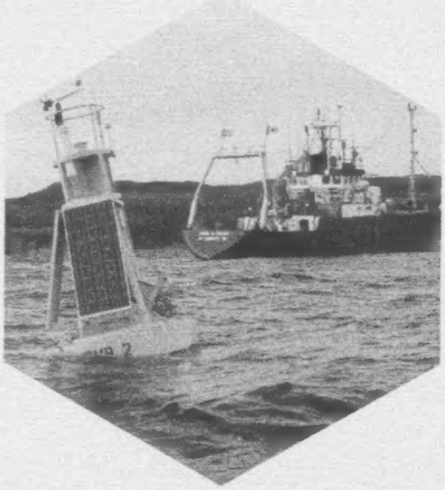
Climate Change Adaptation

Climate change *adaptation* is a fundamental aspect of climate change policy. As a result of the GHG emissions that have accumulated in the atmosphere since the industrial revolution, the Earth is committed to a certain amount of warming and some impacts are now unavoidable. Adaptation encompasses those actions by governments, communities, businesses and individuals to understand, plan for, and respond to unavoidable changes in the climate. This could include, for example, new planning practices to avoid areas at risk of sea-level rise, building infrastructure to higher standards and exploiting economic opportunities such as the growing demand for environmental and water monitoring. Adaptation is often considered more of a local issue compared to GHG reduction efforts as the impacts, challenges and opportunities can be unique to a specific location. As a result, a fundamental component of adaptation is first improving uderstanding of the potential risks and opportunities.

For example, the community of Placentia has experienced the impacts of extreme weather events in the past and is working to adapt to the challenges associated with sea-level rise. In 2007, the Department of Environment and Conservation partnered with the town and a number of entities, including Engineers Canada, on a vulnerability assessment of the town's infrastructure, including the breakwater, protection wall and a section of the Dunville highway damaged during Tropical Storm Chantal in 2007. This project applied the Public Infrastructure Engineering Vulnerability Committee (PIEVC) engineering protocol, and assessed vulnerabilities to the year 2050 from changing climate events. As a result, the highway infrastructure was upgraded to handle more intense precipitation events and the area experienced minimal damage during Hurricane Igor in 2010.

A similar series of events occurred in the City of St. John's, which invested in significant infrastructure upgrades after the flooding associated with Tropical Storm Gabrielle in 2001. As a result of those upgrades, Hurricane Igor caused minimal flooding in St. John's - despite a similar amount of rainfall falling in 2010 as fell in 2001.

Adapting to climate change and better understanding environmental conditions can also present economic opportunities. In June 2009, the Government of Newfoundland and Labrador released its ocean technology strategy – Oceans of Opportunity: Newfoundland and Labrador's Ocean Technology Strategy. The five-year, $28 million strategy is intended to capitalize on opportunities and expand the province's world-class ocean technology sector. One of the major projects the Provincial Government has supported is 'SmartBay', an initiative led by the Fisheries and Marine Institute of Memorial University. SmartBay, located in Placentia Bay, is the largest ocean observation project in



SmartBay Project, Placentia Bay, NL
Image Source: Fisheries and Marine Institute of Memorial University of Newfoundland

eastern Canada, providing weather forecasting, environmental monitoring and ship navigation support. This project, and others, can play a role in monitoring and responding to changes in ocean conditions and this technology could be exported to other jurisdictions.

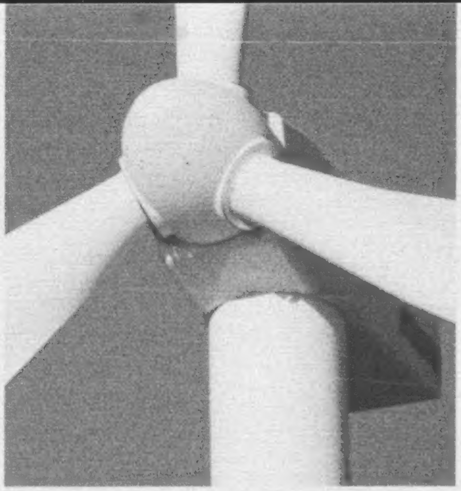
GHG Reduction

Given the scientific findings that the growing concentration of GHG emissions in the Earth's atmosphere are causing climate change, reducing GHG emissions has become a key priority of the global community.

There are strong economic imperatives to devise a clear path forward. The IPCC has found that the cost of reducing emissions is significantly less than the cost of responding to the adverse impacts associated with climate change. Moreover, independent think tanks, like Canada's National Roundtable on the Environment and Economy, maintain that delay in taking action to reduce emissions increases the overall cost of meeting GHG reduction targets by locking in less efficient capital stock and creating uncertainty for businesses which may delay their investment in new, energy-efficient equipment.

The challenge of reducing GHG emissions is considerable given the central role of fossil fuels, such as coal, natural gas and oil, to the global economy. However, as the global economy works to transition to a low-carbon future, jurisdictions like Newfoundland and Labrador are well positioned to capitalize on the new economic opportunities.

Few jurisdictions in North America can match Newfoundland and Labrador's clean energy warehouse. Currently, approximately 85 per cent of the electricity in Newfoundland and Labrador comes from clean energy. The 5428 megawatt (MW) Churchill Falls Generating Station and other smaller hydro and wind projects provide significant clean energy to Newfoundland and Labrador and other locations in North America, displacing the need for GHG-intensive electricity generation.



Through the Energy Plan, the Provincial Government committed to utilize revenues from non-renewable energy resources to further support clean energy development. Newfoundland and Labrador is the second largest producer of conventional light crude oil in Canada, accounting for approximately 35 per cent of total Canadian production in 2010. Revenues from oil production can be invested in opportunities such as the 3,000 MW Lower Churchill hydroelectric project (Phase One – 824 MW Muskrat Falls development; Phase Two – 2250 Gull Island development) and harnassing vast wind energy resources that are unrivalled in North America.

The Provincial Government and Nalcor Energy recently made significant progress towards the development of the Lower Churchill project. On November 18, 2010, the Provincial Government and Nalcor Energy signed a term sheet with Emera Inc. to develop the 824 MW Muskrat Falls project, Phase One of the Lower Churchill project, and associated transmission line from Labrador to Newfoundland and on to Nova Scotia. The negotiation of final agreements is underway in accordance with the terms agreed to in the term sheet. This is an important regional project that offers significant national benefits. It will help Newfoundland and Labrador, Nova Scotia, and other locations in North America grow their economies while reducing GHG emissions. It will enable Newfoundland and Labrador Hydro to displace an estimated 1.2 million tonnes (Mt) of GHG emissions annually from its oil-fired thermal generating station in Holyrood – this is over 10 per cent of the province's current GHG emissions. Further, the project will support an estimated 1 Mt reduction in Nova Scotia and additional reductions of up to 2 Mt in other locations in North America. However, the benefits go far beyond those related to GHG emissions. The development will also increase regional energy stability, enable further renewable developments and, at a cost of $6.2 billion, generate huge economic benefits.

In addition to Muskrat Falls, the province continues to advance work towards the development of Phase Two of the Lower Churchill project, Gull Island, a second hydroelectric site with the potential capacity of 2250 MW (annual average energy production of 12 TWh - Terrawatt hours), to supply electricity markets in the region.

Developments such as the Lower Churchill offer unparalleled opportunities to make a significant reduction in GHG emissions. However, in addition to switching to low or zero GHG-emitting sources of energy, there are other important approaches that can also help to lower GHG emissions while simultaneously supporting economic growth and competitiveness, such as energy efficiency, as set out in Moving Forward: Energy Efficiency Action Plan 2011.

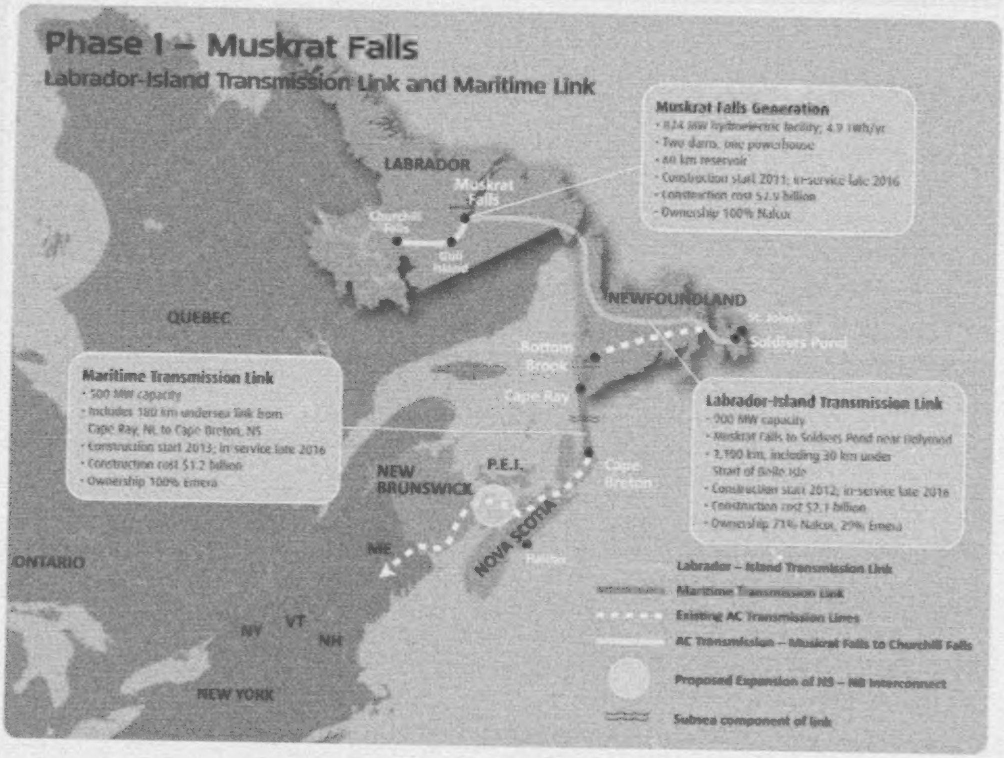
Summary Facts – Muskrat Falls

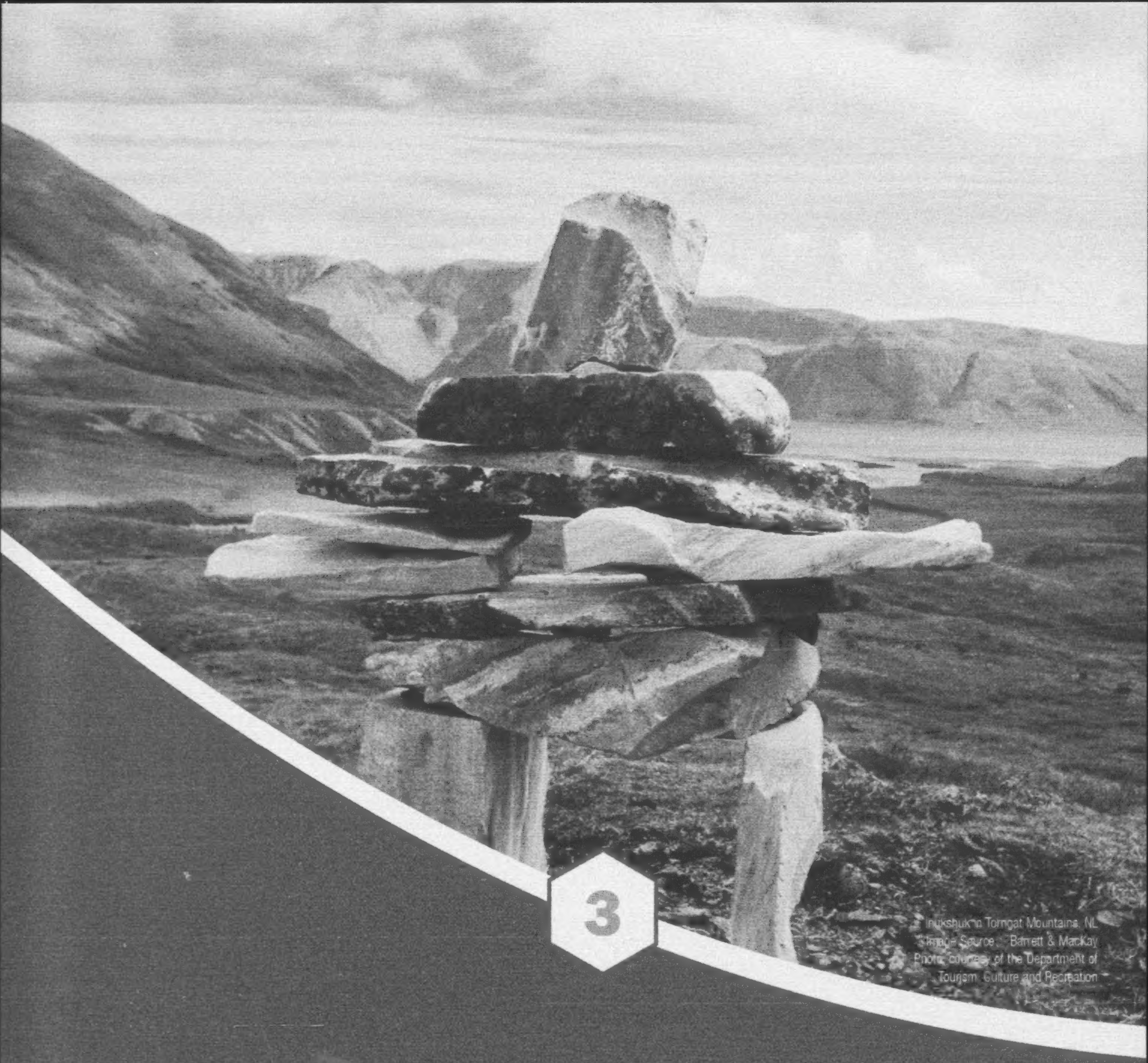
- Newfoundland and Labrador will have an electricity system that will be over 98 per cent GHG-free.
- The development will avoid approximately 96 Mt of emissions by 2065 within the province alone.
- Total income to labour and business for the province will be $1.4 billion and over $210 million in taxes will accrue to the Provincial Government.
- It will result in 8,600 person years of employment in the province (5,400 in Labrador) and indirectly induce employment of 18,400 person years (7,500 in Labrador).
- The Prime Minister of Canada has committed to provide a loan guarantee or equivalent to finance the project.

Muskrat Falls Hydroelectric Project

Top: Signing of the Muskrat Falls Term Sheet. (From left: President and CEO of Nalcor, Ed Martin; then Newfoundland and Labrador Premier Danny Williams; then Minister of Natural Resources and current Premier of Newfoundland and Labrador, Kathy Dunderdale; and Nova Scotia Premier Darrell Dexter)

Right: Electricity transmission map for Muskrat Falls Image Source: Nalcor Energy


Phase 1 – Muskrat Falls
Labrador-Island Transmission Link and Maritime Link
Muskrat Falls Generation
• 824 MW hydroelectric facility; 4.9 TWh/yr
• Two dams, one powerhouse
• 60 km reservoir
• Construction start 2011; in-service late 2016
• Construction cost $2.9 billion
• Ownership 100% Nalcor
LABRADOR
Muskrat Falls
Churchill Falls
Gull Island
QUEBEC
NEWFOUNDLAND
St. John's
Soldiers Pond
Bottom Brook
Cape Ray
Maritime Transmission Link
• 500 MW capacity
• Includes 180 km undersea link from Cape Ray, NL to Cape Breton, NS
• Construction start 2013; in service late 2016
• Construction cost $1.2 billion
• Ownership 100% Emera
Labrador-Island Transmission Link
• 900 MW capacity
• Muskrat Falls to Soldiers Pond near Holyrood
• 1,100 km, including 30 km under Strait of Belle Isle
• Construction start 2012; in-service late 2016
• Construction cost $2.1 billion
• Ownership 71% Nalcor, 29% Emera
NEW BRUNSWICK
P.E.I.
Cape Breton
NOVA SCOTIA
Halifax
ME
ONTARIO
NY
VT
NH
NEW YORK
Labrador – Island Transmission Link
Maritime Transmission Link
Existing AC Transmission Lines
AC Transmission – Muskrat Falls to Churchill Falls
Proposed Expansion of NS – NB Interconnect
Subsea component of link



Inukshuk in Torngat Mountains, NL
Image Source: Barrett & MacKay
Photo courtesy of the Department of
Tourism, Culture and Recreation

3

GOVERNMENT'S STRATEGIC APPROACH

3.0 GOVERNMENT'S STRATEGIC APPROACH

The case for action is clear – jurisdictions that take proactive action on climate change and energy efficiency will be best positioned to harness economic opportunities and manage risk. Jurisdictions that do not act on this agenda may incur higher costs in the long run, miss economic opportunities and could be vulnerable to the adverse impacts of climate change and the associated costs.

The Government of Newfoundland and Labrador is committed to playing a constructive role in responding to climate change and moving forward in a manner that ensures the province will be a model of economic and environmental sustainability. This section outlines the factors that have informed the development of this plan and will guide its implementation.

3.1 Building on Successes to Date

The Provincial Government has established a strong foundation for further action on climate change. In 2005, government released the province's first-ever Climate Change Action Plan which outlined 40 action items focused on reducing GHG emissions, adapting to the impacts of climate change, strengthening the research base on climate change and developing the local and regional partnerships to support collaborative action.

The 2005 plan raised the profile of climate change in Newfoundland and Labrador, making clear the need to pursue a twin-track approach that balances efforts to reduce GHG emissions with moves to advance adaptation to the impacts of climate change. The plan, released by the then Minister of Environment and Conservation, focused on a series of priority actions across government. Some key initiatives pursued through the plan included: climate change risk and vulnerability assessments with communities in the province; public awareness and education efforts through funding for the Climate Change Education Centre; workshops and conferences including hosting the first conference in Canada on climate change and health impacts in 2006 and supporting the Climate Change and Renewable Resources in Labrador conference in 2008; multiple research projects with the academic community; and targeted energy efficiency projects across economic sectors.

In 2007, the Provincial Government released its comprehensive Energy Plan, Focusing Our Energy. The plan laid out the long-term vision to develop the province's energy warehouse and utilize revenue from its non-renewable resources to fund a clean, renewable energy-powered future. While clean energy development, particularly the development of the 3,000 MW Lower Churchill hydroelectric project, was the centerpiece of the Energy Plan, it also laid out government's commitment to advance energy efficiency across the economy. This plan committed to update the 2005 Climate Change Action Plan and prepare a Greenhouse Gas Strategy for the Energy-Intensive Sector, each of which is fulfilled in this document.

The 2005 Climate Change Action Plan and 2007 Energy Plan are the two signature plans that lay out government's commitment to take action on climate change and energy efficiency. These initiatives have been complemented by action taken through other strategies, such as a study of the impacts of climate change on inland fish species in Labrador advanced through the Northern Strategic Plan. The plan also committed to developing a Climate Change Adaptation Strategy for northern Labrador - a commitment that is fulfilled in this document.

These efforts have been complemented by targeted programs like the Newfoundland and Labrador Green Fund, the Atlantic Climate Adaptation Solutions program and other related initiatives.

This plan demonstrates that environmental issues, such as climate change and resource management, are key considerations in government's decision-making and the long-term sustainability of the province. On one level, research is needed to improve the understanding of the environmental impacts of climate change and to enhance capabilities to manage and adapt to it. On another level, investments in research and development (R&D) through to deployment are needed in order to realize the potential benefits of low-carbon technologies. A portfolio of new and existing technologies will be required to achieve the scale of GHG reductions required. Existing technologies can also be deployed to improve the energy efficiency of industrial processes and equipment, commercial and residential buildings, various modes of transportation, and local and regional climate monitoring. Recognizing the significant cost of R&D through to deployment, government policies, programs and regulatory instruments need to focus on the technologies that have the greatest potential for achieving Newfoundland and Labrador's climate change priorities.

3.2 Providing High-Level Government Leadership

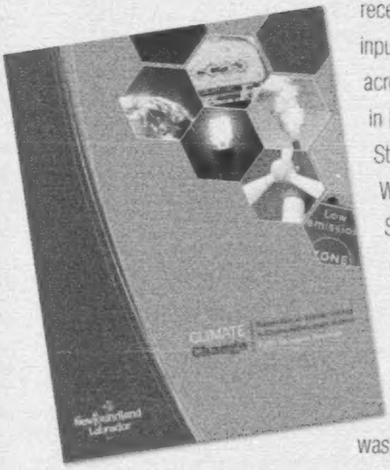
In 2009, the Government of Newfoundland and Labrador established the Office of Climate Change, Energy Efficiency and Emissions Trading. This Office, located in Executive Council and reporting to the Premier, serves as the lead within the Provincial Government for strategy and policy development on climate change and energy efficiency.

The Office of Climate Change, Energy Efficiency and Emissions Trading was established to raise the profile of the issues, boost government's capacity to act in this growing and important area, and to act as a broker across departments, given the cross-cutting nature of the climate change challenge. It implements the priorities of the government and supports actions by departments to better integrate action on climate change and energy efficiency into their operations. The Office led the development of this Climate Change Action Plan and the accompanying Energy Efficiency Action Plan, in consultation with other key departments such as Natural Resources and Environment and Conservation.

Muskrat Falls, NL
Image Source: Nalcor Energy

3.3 Consulting on Climate Change and Energy Efficiency

In May 2010, the Provincial Government released the discussion document, Responding to Climate Change in Newfoundland and Labrador, and invited the public to submit their views. Submissions received to this document were complemented by input from 13 targeted consultation sessions held across Newfoundland and Labrador in June 2010 in Labrador City, Happy Valley - Goose Bay, St. Anthony, Corner Brook, Stephenville, Grand Falls - Windsor, Gander, Marystown, Clarenville and St. John's. These were held with a broad range of representatives from industry, academia, municipalities, labour organizations, and the voluntary and not-for-profit sector.



The input received from this consultation process was highly informative and can be broadly organized into seven key themes:

(a) Government Must Lead By Example: Participants felt that the Provincial Government must capitalize on its ability to influence the behaviour and culture of the people of the province, while supporting change in the marketplace. Examples of possible leadership opportunities included greater energy efficiency in government buildings, lowering the carbon footprint of overall operations, and supporting change through procurement policies and regulation.

> ***Government's Response:*** Demonstrating leadership is a key goal of this plan. This has two aspects: establishing the necessary policies and measures to lead wider society, and managing government's own operations to reduce its carbon footprint. This plan contains a number of commitments to generate enhanced awareness and incorporate climate change considerations into, for example, building management and procurement policies.

(b) Addressing Climate Change is a Shared Responsibility: There was broad agreement that responding to climate change is a shared responsibility that requires action by all parts of society, from individuals and households, to industry, business, academia, the voluntary and not-for-profit sector, and government. Participants felt that government was best placed to facilitate action in all quarters.

> ***Government's Response:*** Since all sectors are responsible for emitting GHG emissions, all sectors must contribute to reducing emissions. Equally, both private and public sectors need to integrate adaptation considerations into their decision-making. With this in mind, this Plan lays out a comprehensive approach towards responding to climate change. It also makes clear the need to continue to work with partners in other governments, business, and the academic and not-for-profit sectors as government moves forward.

(c) Public Awareness Efforts Must be Strengthened: Participants agreed that addressing climate change is a priority but felt that most members of the public have low awareness of the issue, how it could impact the province, and ways that they could make a difference. Some participants noted that they were not always aware of existing programs while others found it difficult to find an authoritative source of advice. There was recognition that a focus on children and youth can provide strong returns over time.

> ***Government's Response:*** In Budget 2011, government committed to develop a new public awareness campaign on climate change and energy efficiency. This new initiative will build on, and seek synergies with, existing campaigns such as the Multi-Materials Stewardship Board's (MMSB) Get to Half campaign, which

aims to reduce waste in the province and the Newfoundland and Labrador Hydro and Newfoundland Power's takeCHARGE initiative that promotes energy efficiency in the residential and commercial sectors.

(d) Government Should Utilize a Variety of Policy Instruments to Affect Change: There was a consistent message from participants that government must utilize a variety of policy instruments to influence the behaviours of individuals and businesses in the province. They felt that behavioural change is unlikely without a multi-faceted approach that utilizes information campaigns, education, research and development, regulation and financial support.

Government's Response: This plan utilizes a variety of policy instruments to move the province forward on climate change. This includes better information and awareness, the exploration of codes and regulations affecting the energy efficiency of buildings and energy-using products, and enhanced research and decision-making tools to support climate change adaptation.

(e) Additional Research is Required on Long-term Impacts: Most participants felt they had observed changes in the provincial climate during the past 10-15 years. There was recognition that more research and monitoring is required to better understand the impacts across communities and regions within the province over time.

Government's Response: The Provincial Government acknowledges the importance of accurate, high-quality information to support decision-making. This plan makes clear the commitment to further strengthen the evidence base going forward, and to continue to work collaboratively with partners in the academic and research sectors. These partners have already made a significant contribution to understanding the impacts of climate change on the province.

(f) Opportunities to Reduce GHG Emissions: The majority of participants indicated that taking steps to improve energy efficiency and fuel-switching presented the best opportunities to reduce GHG emissions in the province. A number of participants indicated that energy efficiency presented opportunities that could be pursued in the short to medium term, while fuel-switching, particularly the development of Lower Churchill, presented strong opportunities in the medium to long term.

Government's Response: Government recognizes the importance of energy efficiency and fuel-switching. This Climate Change Action Plan lays out a multi-faceted approach to reducing GHG emissions that reaches out to all sectors and utilizes various policy instruments to achieve targets. Energy efficiency plays a key role in this effort and the accompanying Energy Efficiency Action Plan outlines Government's approach to promote energy efficiency for the benefit of the province.

(g) Support for Strategic Objectives: There was broad support from participants for the strategic objectives stated in the discussion document, namely:

- To establish credible emissions reduction targets and mechanisms to achieve those targets.
- To consider how to place a value on GHG emissions so businesses and individuals have a financial incentive to consider the climate change impact of their activities.

- To identify and maximize economic opportunities arising from climate change, including clean energy development, innovation and technology advancement.
- To encourage and facilitate businesses, consumers and other users to enhance and maximize energy conservation and efficiency.
- To establish mechanisms to comprehensively address adaptation issues arising from climate change.
- To build public awareness and raise the level of public knowledge about climate change and the role that individuals and organizations can play in tackling it.

> ***Government's Response:*** Each of these objectives has informed the development of this Plan, resulting in the comprehensive approach adopted by government. In addition, government acknowledges the importance of two other strategic priorities raised by participants during the consultations, namely, the need to promote synergies with social objectives where possible and to support research and development. Several key initiatives in this plan, such as the renewal of the energy efficiency program for low income households and the integration of climate change into the province's research efforts, address these imperatives.

3.4 Monitoring Developments in Other Jurisdictions

Responding to climate change is a global challenge as all jurisdictions are affected by the impacts of climate change and must take action to contribute to global GHG reductions. The Provincial Government closely tracks policy development in other jurisdictions to understand the potential implications for Newfoundland and Labrador and identify potential areas for collaboration. Actions by other levels of government, particularly the Federal Government, can inform the directions of the Provincial Government. The actions could include new regulations for certain sectors or targeted programs to reduce GHG emissions.

International

International efforts to address climate change are spearheaded by the United Nations Framework Convention on Climate Change (UNFCCC). The Kyoto Protocol was negotiated in 1997 under the UNFCCC, and it is the first legally binding agreement to set GHG reduction targets for developed countries (like Canada, Japan and those in the European Union), but not developing countries (like China, Brazil or India).

Nations are currently working to develop a new international agreement as the current commitments under the Kyoto Protocol expire in 2012. Significant global efforts have been invested in recent rounds of negotiations in Copenhagen, Denmark in December 2009, and Cancun, Mexico in December 2010, but a new agreement remains outstanding. Efforts are currently being directed at securing an agreement at the next round of negotiations scheduled to take place in Durban, South Africa in December 2011.

These negotiations are important to Newfoundland and Labrador, as they dictate the speed and approach of countries around the world to tackling climate change. They also provide a forum at which countries, sub-national jurisdictions, businesses, non-governmental organizations, and the research community share information on climate change. While Canada participates in these negotiations, any policy commitments that the Federal Government enters into on behalf of Canada, that affect provincial and territorial jurisdiction, must be implemented in partnership with provinces and territories.

North America

In Canada, the Federal Government has committed to reduce GHG emissions by 17 per cent below 2005 levels by 2020. It has yet to release its comprehensive approach to achieve this goal but it continues to advance a series of targeted initiatives on vehicles, biofuels and coal-fired power generation.

The Federal Government continues to develop its approach for the large industrial sector. In 2007, it released its Turning the Corner plan, which would have established a national emissions trading scheme to reduce GHG emissions from large industrial sectors like oil and gas, refining, mining and manufacturing. However, it decided to indefinitely delay this plan upon the election of U.S. President Barrack Obama in November 2008, in order to harmonize its approach with that of the U.S.

Federal Government Initiatives on Climate Change

- Beginning in 2015, new regulations for the coal-fired electricity sector are expected to phase out traditional coal-fired electrical power plants as they reach the end of their commercial life and apply stringent performance standards to new plants. This is intended to meet the federal goal of having 90 per cent of electricity in Canada generated from cleaner energy resources, such as renewable energy or natural gas, by 2020.
- The Federal Government recently harmonized new efficiency standards for light-duty vehicles with the U.S.. It is estimated that by 2016, average new vehicle GHG emissions will be 25 per cent lower than in 2008, with anticipated total GHG reductions of 92 Mt. The Canadian and U.S. governments have also announced their intention to harmonize regulations for heavy-duty vehicles.
- In September 2010, the Federal Government finalized regulations requiring a 5 per cent renewable content in gasoline. It is currently finalizing regulations that would require a 2 per cent renewable content in diesel and home heating oil. Taken together, these regulations are anticipated to reduce GHG emissions in Canada by 4 Mt.

Carbon Pricing

There is widespread recognition of the need to take into account the societal costs of GHG emissions in order to affect reductions. By placing a monetary value on GHG emissions (often referred to as carbon pricing), governments, business and individuals have an incentive to reduce emissions through, for example, energy efficiency improvements or switching to cleaner fuel sources. There are two ways to create a carbon price: carbon taxes or emissions trading.

Carbon Taxes

A carbon tax is intended increase the price of more carbon-intensive fuels relative to less carbon-intensive or zero GHG emitting fuels such as renewable energy. In Canada, British Columbia and Quebec have both adopted carbon taxes. In 2008, the Government of British Columbia introduced a tax on fuels such as gasoline, diesel and propane. The tax is paid at the retail level and has increased over time. While the tax has led to fuel price increases, provincial legislation requires that the revenue from the tax be returned to individuals and businesses through lower income tax and other measures. In contrast, the Government of Quebec levies its carbon tax on fuel distributors rather than consumers and directs the revenue raised to Quebec's Green Fund to support the implementation of the province's climate change strategy.

Emissions Trading

The concept behind emissions trading is straightforward; given that climate change is a global problem and the environmental effect of reducing emissions is the same wherever the reductions take place, it makes economic sense to reduce emissions where the cost is lowest. An emissions trading system allows regulated companies greater flexibility in how they comply with their GHG target, thereby reducing the overall cost of compliance.

Under an emission trading system, a government sets a limit on the amount of GHG emissions that can be released by certain industries each year. Regulated companies are then required to obtain tradable credits to cover their emission levels. Companies that reduce their GHG emissions below the target set by government will require fewer credits and can sell any surplus credits to generate revenue. Companies that are unable to reduce their emissions can purchase credits to comply with their target. Emissions trading systems may also provide for the use of offset credits. These are credits which are generated by GHG-reducing projects in sectors that fall outside of the emissions trading system, for example, a forestation project that reduces GHGs through sequestering carbon dioxide. There are currently emissions trading systems in operation in the northeastern and mid-Atlantic states, the European Union, New Zealand, and under the Kyoto Protocol.

Clarity on the U.S. approach to climate change is beginning to emerge after several pieces of legislation did not pass through Congress in 2009 and 2010. The U.S. Environmental Protection Agency (EPA) has recently advanced two signature initiatives to lower GHG emissions from large industry: (1) in January 2011, the EPA's "Tailoring Rule" became effective which will require that large new or modified facilities obtain permits to emit GHG emissions and utilize best available technologies to minimize GHG emissions; and (2) in December 2010, the EPA announced it would set new performance standards for the electric power plant and oil refinery sectors, which together account for 40 per cent of U.S. GHG emissions.

The direction of the Federal Government is important to Newfoundland and Labrador. It has the jurisdiction and scope to act in a number of policy areas that the province does not (e.g. vehicle efficiency standards), and its policies for sectors such as large industry can have important implications for the province. The Government of Newfoundland and Labrador actively engages the Federal Government through multiple channels to better understand their future directions, and to ensure that the interests of Newfoundland and Labrador are represented.

Provinces, Territories and U.S. States

While the Canadian and U.S. Federal Governments continue to develop their approach to climate change, many provinces and states in North America continue to press forward with innovative policies and programs. For example:

- In 2008, 10 northeastern and mid-Atlantic U.S. states launched the Regional Greenhouse Gas Initiative, which is an emissions trading system covering the electricity sector. Over $886 million has been raised since the first auction of trading allowances, of which about 70 per cent has been re-invested in energy efficiency and renewable energy. In May 2011, New Jersey announced that it intends to withdraw from the initiative.
- Seven U.S. states and four provinces (British Columbia, Ontario, Manitoba and Quebec) are members of the Western Climate Initiative (WCI). WCI intends to introduce a cap-and-trade system in 2012, as well as other regulations, to reduce regional emissions by 15 per cent below 2005 levels by 2020. It is expected that British Columbia, Quebec and California will enter the cap-and-trade system in 2012.
- Alberta is implementing a regulatory framework which seeks to reduce its GHG *intensity* (the GHG emissions to Gross Domestic Product ratio) by 50 per cent between 1990 and 2020. All industrial facilities with emissions of at least 100,000 tonnes participate in the system. Saskatchewan is pursuing a generally similar approach. Nova Scotia is implementing regulations to reduce emissions in its electricity sector.
- British Columbia and Quebec have introduced carbon taxes on the sale of fossil fuels and use the revenue to either fund tax cuts for consumers (British Columbia) or fund further action under their climate change plan (Quebec). Manitoba recently announced that it will introduce a carbon tax on coal-fired electricity emissions.

The Provincial Government closely studies the approaches taken in other sub-national jurisdictions to move forward on climate change to understand the relative merits of their different policies and their relevance to Newfoundland and Labrador. Lessons learned have informed discussions with the large industrial companies on the government's approach to that sector, as well as other priority areas including energy codes and reducing emissions in the transportation sector. Continued collaboration with these partners is a key priority of the Provincial Government as it moves forward with the implementation of this action plan.

Tors Cove, NL
Image Source: ©Barrett & MacKay Photo,
courtesy of the Department of Tourism,
Culture and Recreation

4

A SUSTAINABLE FUTURE

Enhancing Resilience
to Climate Change in
Newfoundland and Labrador

4.0 A SUSTAINABLE FUTURE - ENHANCING RESILIENCE TO CLIMATE CHANGE IN NEWFOUNDLAND AND LABRADOR

As the initial sections of this plan make clear, it is unquestionable that the impacts of climate change present new challenges for the people and communities of the province. The Provincial Government is working to adapt to these challenges and embrace the opportunities that exist, such as improving planning and construction practices, expanding research efforts and improving decision-making tools.

Promoting action on adaptation is a long-term challenge and one that is fundamental to the sustainability of Newfoundland and Labrador. Scientists advise that, because GHG emissions can stay in the atmosphere for significant periods of time, the climate will continue to change even if global GHG emissions were reduced to zero today. This means that the planet is already committed to a certain amount of warming and some impacts are already being seen. However, the extent and severity of impacts over the coming decades will be determined by the level of GHG emissions countries continue to emit going forward. Therefore, efforts to reduce GHG emissions must proceed hand-in-hand with efforts to adapt to a changing climate.

The Provincial Government has moved steadily forward with a series of progressive initiatives on climate change adaptation. In the 2005 Climate Change Action Plan half of the 40 action items were dedicated to understanding the impacts of climate change and supporting adaptation in local communities and economic sectors such as fisheries and aquaculture.

The work of the Provincial Government is complemented by significant expertise in the research and academic community. This includes Memorial University (and related entities such as the Grenfell Campus, the Labrador Institute and the Fisheries and Marine Institute), the Centre for Fisheries Ecosystems Research and the Institute for Biodiversity, Ecosystem Science and Sustainability. The work of these entities has greatly expanded the understanding of climate change in the province and, in the case of many projects, has helped communities better understand and prepare for climate change.

Actions to Date – Climate Change Adaptation:
Through this plan, the Provincial Government is committed to ensuring that Newfoundland and Labrador is a province that understands, prepares for, and is more resilient to climate change. Some of the targeted initiatives that the Provincial Government has supported to date and will build on going forward include:

Understanding Climate Change Impacts

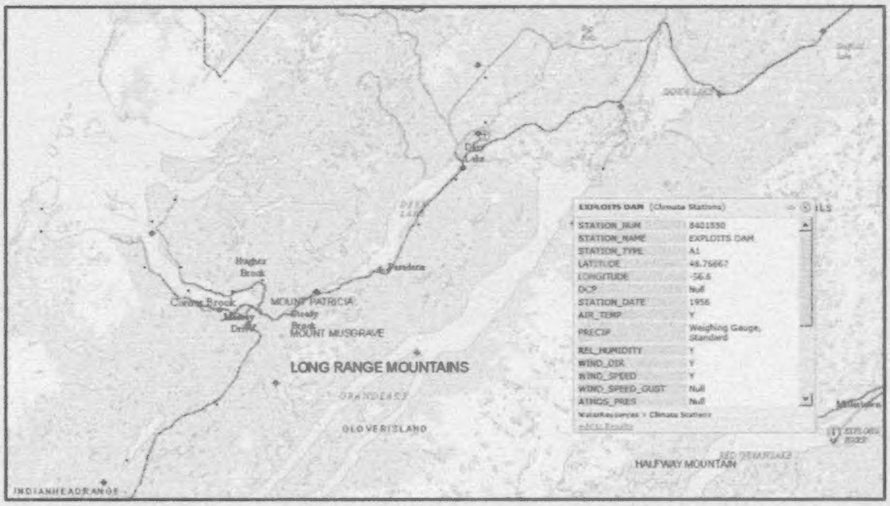
- The Department of Environment and Conservation has funded a number of research projects including studies on the risks and hazards of climate change on communities, the potential impacts of climate change on provincial parks and natural areas, and the impact on natural resources including the fishery. The department has also moved steadily forward on advancing the sustainable development agenda in Newfoundland and Labrador. In 2006, it released a public position paper on sustainable development and it continues to support climate change-related projects through the Institute for Biodiversity, Ecosystem Science and Sustainability.
- The Department of Fisheries and Aquaculture has provided extensive support to fisheries monitoring and research related to climate change as it can affect, for example, invasive species and the safety of aquaculture operations from storm activity. A new Aquaculture

St. John's, NL

Fish Health Facility in St. Albans, as well as existing partnerships with Memorial University and the Fisheries and Marine Institute, will further support this work.

- The Office of Climate Change, Energy Efficiency and Emissions Trading commissioned Dr. Norm Catto from Memorial University to conduct a review of the existing literature on impacts and adaptation within, and relevant to, Newfoundland and Labrador.
  A copy of the study can be found at:
  http://www.exec.gov.nl.ca
  /exec/cceeet/publications/index.html
- In February 2011, the Office commissioned a study of climate change monitoring capabilities in the province. This study seeks to: (1) develop a comprehensive inventory of the number, location and characteristics of climate monitoring stations in the province; (2) understand the needs of key industries, entities and stakeholders as they relate to climate data and information; and (3) identify measures to address any identified weaknesses or deficiencies in the province.
- The Department of Environment and Conservation has established a number of climate stations to monitor and track daily weather and trends over time. Data from these sites are available through the Water Resources Portal, an online Geographic Information System that allows the public access to information on these climate sites. It is located at: http://maps.gov.nl.ca/water/

Water Resources Portal – The Department of Environment and Conservation's online Water Resources Portal provides information on the climate in Newfoundland and Labrador and links to many climate stations in the province. This Geographic Information System is publicly available and is a valuable decision-making tool for community managers, emergency management personnel and the private sector. The image below depicts western Newfoundland and various climate stations maintained by the Provincial and Federal Governments that provide specific information about that area.



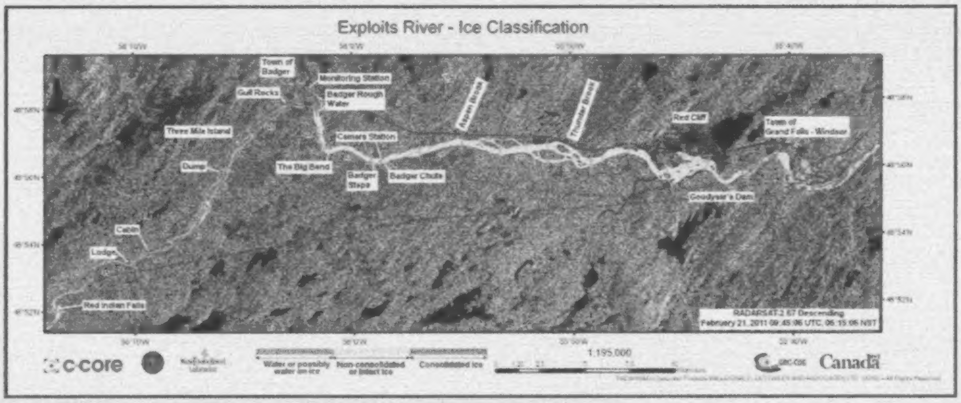
EXPLOITS DAM (Climate Stations)

STATION_NUM	8401550
STATION_NAME	EXPLOITS DAM
STATION_TYPE	A1
LATITUDE	48.76667
LONGITUDE	-56.6
DCP	Null
STATION_DATE	1956
AIR_TEMP	Y
PRECIP	Weighing Gauge, Standard
REL_HUMIDITY	Y
WIND_DIR	Y
WIND_SPEED	Y
WIND_SPEED_GUST	Null
ATMOS_PRES	Null

WaterResources > Climate Stations

Map from the Newfoundland and Labrador Water Resources Portal
Image Source: Department of Environment and Conservation

- The Department of Environment and Conservation has implemented targeted projects for areas that are at a particular risk of flooding, such as the Town of Badger.



Map from the Badger River Ice Service
Image Source: Department of Environment and Conservation

Badger River Ice Service

An innovative project in the Town of Badger comprise of real-time cameras on the Exploits River and flood forecast models, satellite imagery and risk alert systems for provincial, community and emergency response personnel. This project was developed in partnership with the European Space Agency and has been presented internationally as a model for other jurisdictions to learn from, including at the 2008 United Nations Climate Change Conference in Poland. The Badger River Ice Service is currently provided with the support of the Canadian Space Agency and Public Safety Canada. The image above is a satellite image of the Exploits River that provides information on ice conditions. Decision makers are able to assess where ice is building up and becoming consolidated, which increases the potential for an ice jam and flooding in Badger.

Integrating Adaptation into Decision-Making

The Provincial Government, in particular the Department of Environment and Conservation, has worked with several non-government organizations, including the Climate Change Education Centre, Building Owners and Managers Association (BOMA), Newfoundland Environmental Industry Association (NEIA), and the City of St. John's to raise awareness on climate change and promote the integration of this issue into decision-making. Initiatives have included:

- In 2006, a conference on climate change and health was held to raise the profile of the impacts of climate change on public health. This two-day conference looked at a broad scope of impacts due to warming temperatures, including the effects of natural disasters and the related stress on public health and service delivery.
- In 2008, a Municipal Climate Adaptation Workshop for the Atlantic provinces was held to bring information on climate change adaptation to the municipal level. It was a collaborative effort by the Conference of New England Governors and Eastern Canadian Premiers, International Council for Local Environmental Initiatives, and the Federation of Canadian Municipalities.
- Since April 2010, the province has partnered with the other Atlantic provincial departments of the environment and Natural Resources Canada on the Atlantic Climate Adaptation Solutions initiative, which is advancing a number of collaborative efforts on climate change adaptation.
- At the July 2010 Council of the Federation (COF) meeting, Premiers launched the Climate Change Adaptation Community of Practice to facilitate the sharing of knowledge among academics and experts across the country, with the goal of helping governments incorporate climate change adaptation into planning and policies.
- In March 2011, two workshops on increased storms and weather hazards were held in Corner Brook and St. John's to help advance community understanding and capacity to adapt to climate

Atlantic Climate Adaptation Solutions Initiative

In April 2010, the four Atlantic provinces and the Federal Government launched the Atlantic Climate Adaptation Solutions (ACAS) initiative. This $8.5 million initiative is helping communities integrate climate change considerations into community planning, engineering practices, and water and resource management decisions. In Newfoundland and Labrador, this initiative is led by the Department of Environment and Conservation, and local projects include:

- Local climate forecasting to the year 2100, specifically targeted at helping communities make better informed planning decisions.
- The Community Vulnerability Assessment Tool to help communities identify where they are vulnerable to the impacts of climate change.
- Development of a Climate Change Adaptation Toolkit to provide communities with the Community Vulnerability Assessment Tool and supporting resources to assist with the integration of adaptation into decision-making.
- An assessment of areas at risk of flooding and a revision of the Flood Risk Mapping Protocol to incorporate climate forecasting and high-resolution mapping tools.

Sea Stacks, Trinity Bay, NL

- An assessment of coastal risks and vulnerabilities (e.g. sea-level rise, coastal erosion, and storm surges).
- Enhancing capacity of practitioners to adapt to climate change by supporting symposiums, conventions and related events held by community planners, engineers and municipal groups. For example, on March 23-24, 2011, the Department of Environment and Conservation hosted the Advancing Decision-Making in a Changing Climate conference, which focused on bringing together municipalities, planners, engineers, provincial and federal governments, researchers, and the insurance industry to share information on adaptation.

change. These were held in partnership with the Humber Arm Atlantic Coastal Action Program and the Building Owners and Managers Association.

- In June 2011, the Departments of Fisheries and Aquaculture and Environment and Conservation released government's Coastal and Ocean Management Strategy and Policy Framework. Climate change has been identified as a priority issue for this work. The document can be found at: http://www.gov.nl.ca/fishaq/publications/coastal strategy_2011.pdf

Actions Going Forward – Climate Change Adaptation:

The Provincial Government will continue to move forward on a province-wide agenda on climate change adaptation. This includes targeted efforts to address the unique challenges of climate change in northern Labrador, fulfilling a commitment in the Northern Strategic Plan to establish a climate change adaptation strategy for this area.

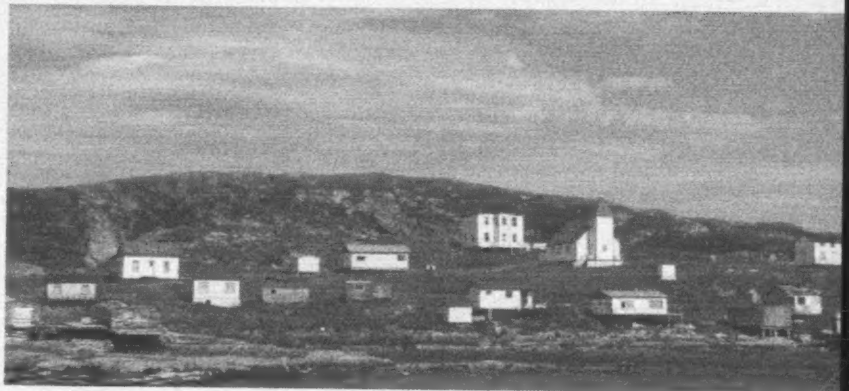
Over the next five years, the Provincial Government will pursue a series of new actions items, including:

Understanding Climate Change in Newfoundland and Labrador

- Collaborate with other governments and the research and academic community with a view to strengthening long-term climate forecasting for the province.
- Consider the findings of the study on climate change monitoring capabilities in the province and next steps.
- Collaborate with the Federal Government to strengthen climate monitoring networks and information on local precipitation trends to support infrastructure design.
- Continue to strengthen the Newfoundland and Labrador Water Resources Portal and work to identify additional sources of information that can be digitized and made publicly available through this Geographic Information System.
- Continue to implement the Forest Research Strategy which has a strategic focus on better understanding the impacts of climate change on forests in the province.
- Work with the academic and research community to develop research priorities and enhance the dialogue on the impacts of climate change in Newfoundland and Labrador.

Intensity-Duration-Frequency Curves

Climate change may cause more or less precipitation in specific locations. The best way to understand potential future trends is through a rainfall intensity-duration-frequency curve - more commonly referred to as an "IDF curve". This tool, based on statistical analysis of past rainfall patterns, can estimate the likely intensity, duration and frequency of future rainfall events. This tool is utilized globally by governments, engineers and the construction industry to design infrastructure such as roads and bridges to appropriate standards. In the absence of an IDF curve, the specifications for infrastructure may be too high, which increases costs unnecessarily, or too low, which may present challenges in heavy precipitation. In Canada, the federal government has traditionally provided IDF curves to provinces and territories. The Provincial Government is committed to working with the Federal Government to ensure that IDF curves are up-to-date and that local decision makers have timely access to the right information to develop the province's infrastructure.



Battle Harbour, NL
Image Source: Shirley Walsh

Integrating Adaptation into Decision-Making

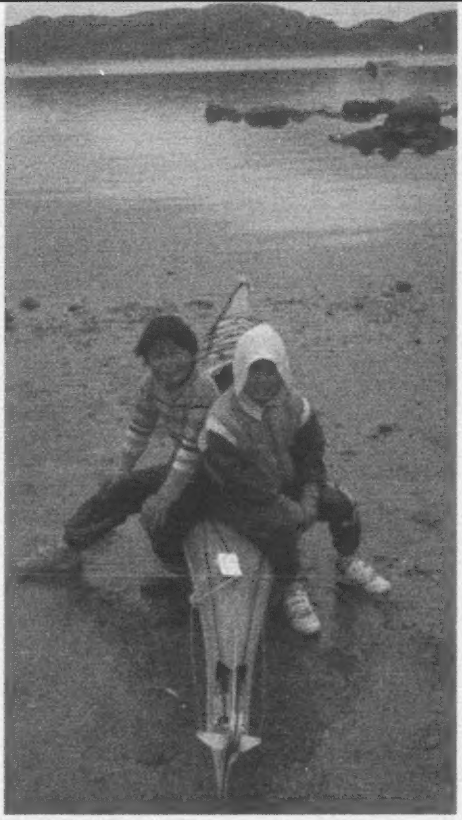
- Continue to implement the ACAS project and partner with Municipalities Newfoundland and Labrador and Professional Municipal Administrators to roll out the findings to all communities.
- With a $600,000 annual investment over three years through Budget 2011, establish new flood risk maps for at-risk locations and, where it is possible to predict flooding, alert systems to notify government, communities and emergency response personnel of potential flooding. The new maps will incorporate climate change predictions to enhance their ability to support informed decisions and community planning.
- With a $100,000 annual investment over three years through Budget 2011, establish a new Coastal Erosion Monitoring and Mapping

Program and make the data and reports available through the Newfoundland and Labrador Water Resources Portal and other publications.
- Continue to include consideration of climate change implications (e.g. potential for flooding) in the site selection and design of Provincial Government buildings and infrastructure and extend these considerations to those receiving public funding.
- Continue to implement and enforce the Land Use Policy for Flood Risk Areas.
- Analyze opportunities to incorporate climate change considerations into community planning efforts, with a view to identifying opportunities for synergies across planning processes and minimizing administrative burden.
- Continue to support communities in their preparation of Emergency Management Plans, which are due by May 2012.

4.1. Climate Change in Northern Labrador

In the Northern Strategic Plan, the Provincial Government recognized the need for targeted action to address climate change in northern Labrador and committed to prepare a dedicated strategy on adaptation for the region. Northern areas across the globe are experiencing the most significant impacts, including reduced ice conditions, unstable and thawing permafrost, and changes in wildlife and vegetation. Impacts in the north are of considerable interest to southern regions, as they provide indicators of future potential changes.

There are many signs of climate change in northern Labrador and these impacts will present challenges for communities if they become the long-term norm. For example, winter sea ice in northern Labrador has been trending lower for years and the area experienced historically low conditions in the winter of 2009 and below normal patterns in 2010. This presents new challenges for communities, as the sea ice forms part of the winter highway for some coastal Labrador residents and directly connects communities and individuals to traditional hunting grounds, wood and country food sources that are important for public health, community sustainability, and local culture. Further study is needed over time, but the trends follow those of the greater Arctic. For example, the U.S. National Snow and Ice Data Centre recently issued a news release stating that January 2011 set a record low for Artic sea ice for that month. The news release also stated that sea ice in the broader north was "unusually low" and the Labrador Sea was found to be completely ice free


Nain, NL
Image Source: Department of Tourism, Culture and Recreation

Change in winter sea ice is one of the most important and dramatic impacts in northern Labrador, but there are other changes that can affect the region and its communities, including:
- Thawing permafrost, which can impact infrastructure and community development.
- Variability in snowfall and snowmelt, which can affect run-off, water quality and flood risk.
- Changes in temperature, precipitation and seasons, which can affect fish, seals, terrestrial wildlife, such as Caribou, and other country food sources, such as berries.

The Provincial Government is committed to working to improve the resilience of northern Labrador to climate change and recognizes that its province-wide objectives outlined in the previous section must be, at times, customized for northern Labrador's unique circumstances. Good cooperation and information sharing is particularly important, as there are multiple entities already working actively on adaptation in northern Labrador including the Nunatsiavut Government, the Innu Nation, the Federal Government and researchers from a variety of institutions such as Memorial University and the Labrador Institute.

Equally, there are unique aspects to adaptation in northern Labrador relating to traditional knowledge and lifestyles which offer opportunities to broaden and deepen understanding of how the climate is changing and what it means for communities.

Adaptation in Northern Labrador – Actions to Date:

The Provincial Government, in particular the Department of Environment and Conservation, has worked to strengthen adaptation in northern Labrador, including:

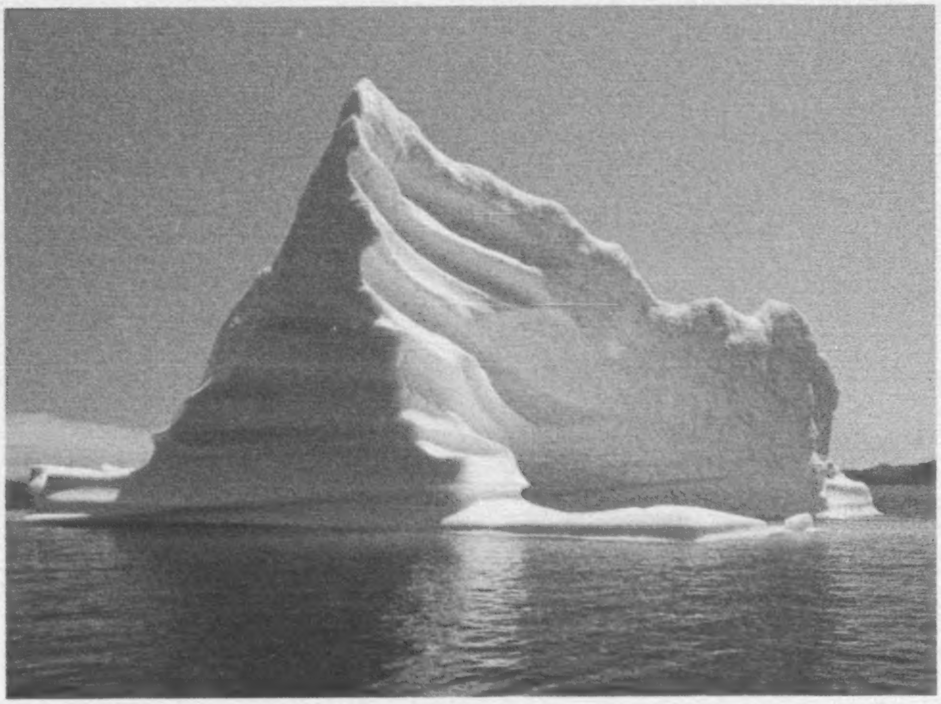
- Through the ACAS program, partnered with Memorial University to undertake a community-level vulnerability assessment with the community of Nain, as well as the development of case studies on adaptation in the north.
- Established targeted working groups with the Nunatsiavut Government and Innu Nation to enable an ongoing dialogue on climate change adaptation and the identification of opportunities for collaboration. These relationships are a fundamental component of understanding community-level impacts of climate change and identifying ways forward that are relevant to communities.
- Supported forums including the Climate Change and Renewable Resources conference hosted by Memorial University and the Labrador Institute in 2008. Based on the priorities of this conference, the Department of Environment and Conservation provided funding to develop a searchable, internet database of climate change-related research in Labrador and a community-based Observer Program for individuals to report their observations of climate-related changes on the land.
- Supported the Nunatsiavut Government's Tukisinnik Community Research Forum in June 2010 which was designed to improve collaboration amongst communities, researchers and governments, as well as to understand ongoing research and identify research priorities for northern Labrador.
- Funding research on the important role that cultural identity and values play in guiding community actions around climate change adaptation, decision-making and building local capacity.
- Partnering with the Nature Conservancy of Canada to develop the Conservation Blueprint for Labrador. This project, funded through the Northern Strategic Plan, will provide baseline data and a redefinition of Labrador's natural region boundaries to support planning, long-term biodiversity conservation and climate change adaptation.
- Conducting a multi-year sampling of lake trout in three northern Labrador lakes. The purpose of this study is to assess the impacts of warming lake water temperatures on the size, survival and reproduction of lake trout and long-term effects on lake trout populations.

Torngat Mountains, NL
Image Source: Chris P. Sampson

Actions Going Forward – Climate Change Adaptation in Northern Labrador:

The Provincial Government's future directions on climate change adaptation in northern Labrador will be long-term, collaborative in nature and guided by an overarching objective to strengthen the relationships with the Nunatsiavut Government, the Innu Nation and the research community on climate change adaptation in northern Labrador. Working through these relationships, the Provincial Government will apply its previously outlined priorities on adaptation to northern Labrador and also:

- Identify ways to better engage northern Labrador communities on issues pertaining to climate change adaptation.
- Promote best practices in community development in the north through appropriate planning and building practices to support long-term sustainability.
- Identify ways in which decision-making tools on climate change in northern Labrador could be improved, such as climate observation networks, flood risk mapping and information on local ice conditions.
- Identify research needs on climate change in northern Labrador and work with other partners to consider the best way to address them.
- Share expertise and information with a view to supporting the shared future directions and plans of the Nunatsiavut Government, Innu Nation and Provincial Government.



Battle Harbour, NL
Image Source: Shirley Walsh

5

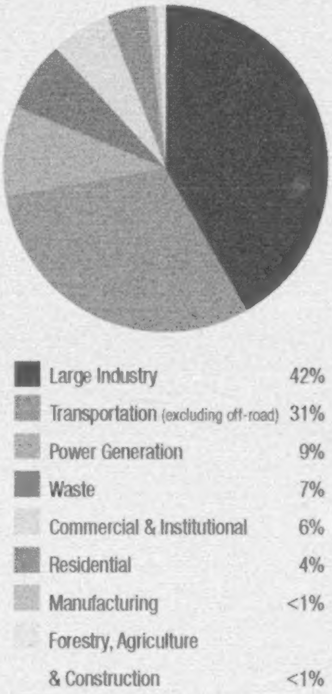
A SHARED CHALLENGE

Reducing Greenhouse Gas Emissions in Newfoundland and Labrador

5.0 A SHARED CHALLENGE – REDUCING GREENHOUSE GAS EMISSIONS IN NEWFOUNDLAND AND LABRADOR

The latest science makes clear that the rise of GHG emissions in the atmosphere is impacting the world's climate and causing it to warm. As a result, nations around the world are working to reduce GHG emissions to avoid the worst potential impacts and realize economic opportunities such as clean energy development. Without international effort to reverse the growth in GHG emissions, concentration levels will continue to rise. The extent of future warming will therefore be strongly dependent on the quantity of GHG emissions released into the atmosphere in the coming decades. To avoid dangerous climate change, the IPCC advises that global emissions must peak by 2015 and fall by between 50-85 per cent below 2000 levels by 2050.

Figure 1: Newfoundland and Labrador GHG Emissions by Sector, 2009



Source: Estimated from Environment Canada data, 2011.

Gros Morne, NL
Image Source: ©Barrett & MacKay Photo, courtesy of the Department of Tourism, Culture and Recreation

Developed countries are primarily responsible for the current levels of GHG emissions in the atmosphere, but a new and challenging dynamic is the GHG growth that is occurring in developed countries such as China, Brazil and India as they grow their economies. All jurisdictions have a role to play in reducing GHG emissions and the Provincial Government has committed to play its part.

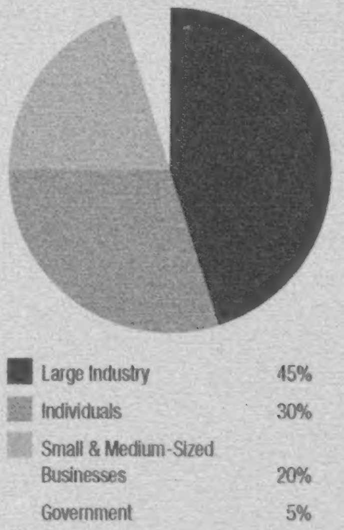
In 2009, the most recent year with available data, GHG emissions in Newfoundland and Labrador were 9.5 Mt, which equates to a 2.7 per cent increase over 1990 levels. The largest sources of GHG emissions in the province were large industry (42 per cent), transportation (31 per cent), power generation (9 per cent) and waste (7 per cent). Much of the growth in Newfoundland and Labrador's GHG emissions since 1990 can be attributed to the strong economic growth experienced in the offshore oil sector and other large industries.

GHG Emissions by End User in Newfoundland and Labrador - In the National Inventory Report, Environment Canada provides estimates of industry and sectoral-level GHG emissions. This includes estimates for stationary combustion sources (e.g. buildings, oil platforms and mines), transportation, fugitive emissions (e.g. offshore gas flaring), industrial processes and waste.

Using a Statistics Canada national methodology and Environment Canada data, provincial-level estimates of emissions can be developed for individuals, small and medium-sized businesses, large industrial facilities and government. These estimates include all the GHG emissions that each of these groups is responsible for. In other words, it not only includes the emissions associated with direct energy use (eg. home heating oil), it also includes indirect energy use (eg. electricity from the grid), transportation and waste emissions. This differs from Figure 1 where emissions from transportation, waste and electricity generation at Holyrood are not attributed to those who actually undertake the travel, generate waste, or use the electricity, but are presented separately by category as per the National Inventory Report. In contrast Figure 2 gives an idea of the total contribution of different groups' activities to provincial GHG emission levels.

For this province, large regulated facilities are estimated to account for 45 per cent of total provincial emissions in 2009, individuals for 30 per cent, small and medium-sized businesses for 20 per cent, and government for 5 per cent.

Figure 2: Newfoundland and Labrador GHG Emissions by End User, 2009



Source: Estimated from Environment Canada data, 2011.

Newfoundland and Labrador is responsible for 1.4 per cent of GHG emissions in Canada. The province has the second lowest overall GHG emissions among provinces, but is fifth among provinces in terms of per capita emissions due to its large resource-based economy and relatively small population.

The Provincial Government has worked actively through multiple forums such as the Conference of New England Governors and Eastern Canadian Premiers (NEG-ECP) to take collaborative action on climate change. The NEG-ECP comprises five Premiers (the four Atlantic provinces and Quebec) and six U.S. Governors (Massachusetts, Connecticut, New Hampshire, Vermont, Rhode Island and Maine). It has committed to reduce GHG emissions and established regional reduction targets that are:

- To reduce regional GHG emissions to 1990 levels by 2010;
- To reduce regional GHG emissions to 10 per cent below 1990 levels by 2020; and
- To reduce regional GHG emissions to 75-85 per cent below 2001 levels by 2050[2].

In the 2007 Energy Plan, the Government of Newfoundland and Labrador committed to pursue these targets on a provincial basis and it reaffirms this commitment to this Climate Change Action Plan.

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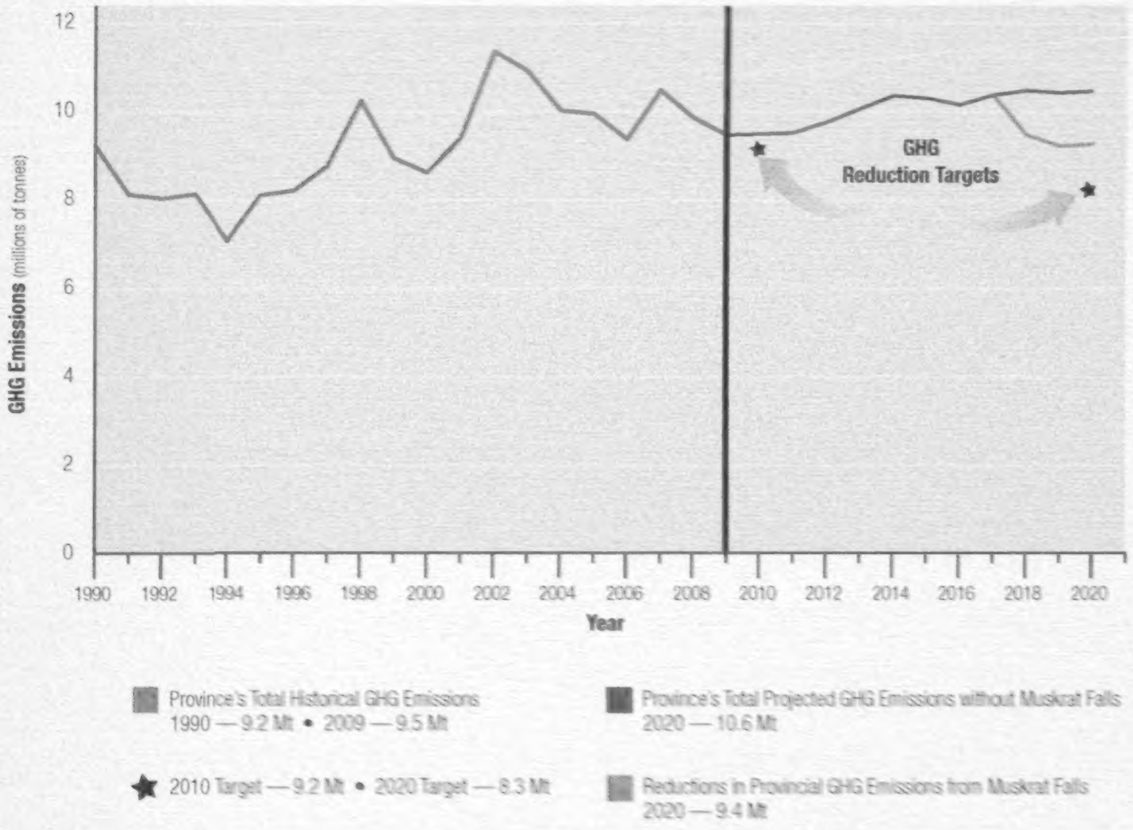
[2] Information is not yet available to determine whether the NEG-ECP has achieved its 2010 regional reduction target.

Current projections by the Provincial Government for the year 2020 show that, in the absence of any new measures to control GHG emissions, provincial emission levels will continue to grow and the province will not meet the 2020 target. This is because other major developments in the province, such as Hebron offshore oil development, will increase GHG emissions while generating economic growth and employment. Against this backdrop and the fact that over 85 per cent of the province's electricity is currently generated from renewable energy, reducing emissions in line with the NEG-ECP target on a provincial basis will be demanding. However, the government remains committed to the NEG-ECP targets. The targets are intended to be challenging and they are designed to motivate action and raise levels of ambition. The Provincial Government is committed to ensuring this province does its part to tackle climate change and that the actions taken are both environmentally sustainable and economically prudent. Government aims to maximize opportunities such as the development of Muskrat Falls and, in the longer term, Gull Island.

Figure 3: Historical and projected GHG emissions in Newfoundland and Labrador, 1990-2020 (millions of tonnes, Mt)



Source: Historical emissions taken from Environment Canada; projections based on internal analysis.

The publication of this document and the commitments within it represent an important milestone as the province moves forward. This Action Plan articulates what further action the province intends to take to reduce GHG emissions over the next five years. A key premise of this effort is that action is required by every part of society and by all sectors. However, this plan is not the end of the story. Beyond the 2020 target, the NEG-ECP has committed to a 2050 target to reduce GHG emissions levels by between 75-85 per cent below 2001 levels. As such, government recognizes that further steps will be needed to address this long-term challenge. The NEG-ECP region is not alone in committing to long-term targets of this magnitude, as this is what the science indicates is necessary.

Example GHG Reduction Targets for 2050

Jurisdiction	2050 Target
Ontario	80% below 1990 levels
British Columbia	80% below 2007 levels
Nova Scotia	80% below 2009 levels
California	80% below 1990 levels
Washington	50% below 1990 levels
European Union	80-95% below 1990 levels
Australia	80% below 2000 levels

Source: Information from respective jurisdiction's climate change plans.

Additional actions to meet the province's targets will continue to be identified as this plan is implemented. It is clear that deep reductions will require a major transformation and that research and development into new technologies will play a key role, as well as the deployment of existing solutions including fuel-switching to hydroelectricity and promoting greater energy efficiency. It will also require ongoing collaboration with other jurisdictions and the Federal Government in a bid to identify how government can, in partnership, drive the changes needed while maximizing the opportunities and minimizing risks. Government will be monitoring its progress towards delivering the commitments in this plan as well as continuing to identify further ways to make progress.

5.1 Leading by Example – Provincial Government Action

The Provincial Government has a unique and important role to play in the province's efforts on climate change. Through the publication of this plan and the companion document Moving Forward: Energy Efficiency Action Plan 2011, the Provincial Government has set out a vision for the future that is supported by a clear pathway forward and 75 action-oriented commitments. Government will now drive forward with the implementation of these commitments, with a view to promoting engagement by all parts of society. While developing and delivering against this plan is one key role for government, leadership must also extend to how government conducts its own operations and ensuring this is done in a manner consistent with this plan and that on energy efficiency.

During the consultations on climate change and energy efficiency in the spring and summer of 2010, participants agreed that the Provincial Government should lead by example in reducing GHG emissions and improving energy efficiency. The operations of the Provincial Government are extensive and government is committed to continue to identify how it can reduce its GHG footprint while maintaining public services and, where possible, lowering government's operating costs. For example:

- *Buildings:* The government owns 840 buildings with approximately 600,000 m² of floor space and departments lease over 90,000 m² throughout the province. Government also constructs a number of new buildings on a regular basis and provides funding for municipalities to do the same. This presents opportunities to identify energy savings and utilize modern construction and management techniques to reduce operating costs and improve the quality of the building environment.

- *Employees*: The Provincial Government, including its agencies, boards and commissions has over 45,000 employees, and there is an opportunity to engage this community of professionals to lower the overall footprint of the Provincial Government by, for example, web conferencing in place of travel or turning off appliances when not in use, and using only two-sided printing on recycled paper.
- *Waste*: The operations of the Provincial Government can generate significant volumes of waste. With new or pending waste management infrastructure throughout the province, supported through government's Solid Waste Management Strategy, there are more opportunities to recycle, compost and generally reduce waste.

Government-owned heavy truck, water bomber, and the Grace Sparkes Ferry
Image Source: Department of Transportation and Works

- *Fleet*: The Provincial Government owns over 3,000 vehicles, which include light vehicles, heavy equipment and utility vehicles. This presents opportunities for fuel and cost savings.
- *Procurement*: In 2009-10, government purchased over $1 billion in goods and services. This can present opportunities to support the climate change agenda by purchasing items with low carbon footprints, including high-efficiency appliances and equipment.

In addition to the potential for GHG reductions in its own operations, the Provincial Government has the capability to establish broader policy and strategic frameworks to generate action across the economy. Important aspects of this include the efficient and effective delivery of programs and services, giving strategic consideration to whether public procurement policies and other government initiatives can help to transform markets for energy-efficient products and services, and ensuring that high-quality information is made available in a timely fashion to promote energy efficiency within the province. The Provincial Government is committed to strengthening the framework for action in Newfoundland and Labrador to facilitate shared and collaborative action on climate change.

Initiatives to Date – Provincial Government Action:

The Provincial Government has exercised its leadership potential on climate change and has developed plans and programs to advance action on climate change. It has also implemented a variety of initiatives across its own operations consistent with the goals of this plan. Some examples of actions to date include:

Framework for Action

- In the 2005 Climate Change Action Plan and 2007 Energy Plan, the Provincial Government established its strategic framework to move forward on climate change in the province.

These comprehensive plans have been complemented by extensive collaboration through intergovernmental forums such as the Council of the Federation.

- In 2008, the Provincial Government became a member of the Climate Registry, fulfilling a commitment made by Premiers at the 2007 Council of the Federation meeting. The Climate Registry is a non-profit entity that sets consistent and transparent standards to calculate, verify and publicly report GHG emissions. All provinces in Canada are members of the Climate Registry.
- In 2009, then Premier Danny Williams attended the Governors Global Climate Summit in Los Angeles. This summit, hosted by the Governor of California and co-chaired by several other Governors, brought together sub-national leaders from around the world to chart a way forward on climate change. The event culminated with the signing of a declaration by 30 global leaders on a shared commitment to act on climate change.

Buildings

- Building upon a commitment in the 2007 Energy Plan, the Build Better Buildings Policy requires that all new government-owned or government-funded buildings and major renovations exceed the 1997 Model National Energy Code for Buildings by 25 per cent and, where practical, qualify for Leadership in Energy and Environmental Design (LEED) Silver status. A number of new government buildings have been built to LEED standards including new schools in Torbay and Paradise and the long-term care facility in Corner Brook.

Corner Brook Long-Term Care Facility

On October 26, 2005 then Premier Danny Williams turned the sod on the site of the Corner Brook Long-Term Care Facility. Not only has the building been designed to meet government's commitment to enhancing the long-term care and accommodations for seniors in the region; it has also been designed to meet energy efficiency standards in its day-to-day functions.

The long-term care facility has been designed to exceed the standards of the 1997 Model National Energy Code for Buildings and to achieve silver status under the LEED program.

Key features of the building include:

- Energy-efficient lighting such as fluorescent lamps with electronic ballasts and lighting controls with occupancy and daylight sensors.
- Heating from a ground source heat pump system.
- HVAC systems comprising high-efficiency fans modeled with an increased pressure drop to account for the added resistance associated with the heat recovery.
- Efficient water consumption through low-flow fixtures such as faucets and showers.

The benefits include (relative to a building constructed to traditional standards):

Anticipated Annual Reduction in Energy Use:	**52.5%**
Anticipated Annual Energy Cost Savings:	**55.6%**
Anticipated Annual Energy Cost Savings:	**$269,000**

Corner Brook Long-Term Care Facility, NL
Image Source: Department of Transportation and Works

Leadership in Energy and Environmental Design (LEED) – LEED is an internationally recognized third-party certification program for the design, construction and operation of high performance green buildings. It provides building owners and operators with the tools they need to have an immediate and measurable impact on their buildings' performance. With four possible levels of certification (certified, silver, gold and platinum), LEED is flexible enough to accommodate a wide range of green building strategies that best fit the constraints and goals of particular projects. Source: Canada Green Building Council

- Energy audits and engineering studies have recently been conducted on several large buildings in the Avalon region, including the Confederation Building. These efforts identified vast amounts of potential energy savings and they form the basis of many ongoing efforts to upgrade buildings.
- The Provincial Government has successfully implemented the BOMA BESt building management certification process on the Natural Resources Building in St. John's. In May 2011 the Department of Transportation and Works received an award from BOMA Newfoundland and Labrador for the Natural Resources Building as it received the highest level of certification of any building in the province for the year.

Newfoundland and Labrador Green Fund – Support for Public Sector Projects

The Newfoundland and Labrador Green Fund, delivered by the Department of Environment and Conservation, is a three-year $25 million program cost-shared with the Federal Government. It supports a wide range of climate change and GHG reduction efforts, including energy efficiency projects, small-scale wind turbines, a district heating study, biofuel and methane capture projects. Projects that have been supported in the public sector include:

- Funding for the Robin Hood Bay Regional Waste Management Facility to implement methane capture and flaring technology. This project has the potential to reduce GHGs by 50,000-60,000 tonnes per year.
- Funding to support the new Corner Brook City Hall construction. The building design incorporates environmental features such as a green roof and a "Window on the World" building performance system, which publicly displays the building's energy performance. The building is expected to save approximately 500 tonnes of GHGs per year.
- Funding for several new schools, such as the Torbay K-6 School. With energy savings measures, particularly the use of a Ground Source Heat Pump System, this school is expected to save over 1,000 tonnes of GHG emissions per year versus a standard building.
- Support for energy efficiency upgrades to Provincial Government buildings, including lighting retrofits, the installation of occupancy sensors and modifications to central control systems at the Confederation Building.

BOMA BESt – The Building Owners and Managers Association (BOMA) Building Environmental Standards (BESt) program is a national initiative launched in 2005 by BOMA Canada. It was created to address an industry need for realistic standards for the energy and environmental performance of existing buildings based on accurate, independently verified information. Today, BOMA BESt has evolved from simply identifying key best practices to providing: (i) common standards; (ii) an array of educational and on-line assessment tools; (iii) independent data audits; and (iv) a performance certification program.

On May 17th, 2011 the Department of Transportation and Works received official recognition for the first BOMA BESt certified provincial government building. The Natural Resources Building, located at 50 Elizabeth Avenue, St. John's, was awarded one of the highest levels of BOMA BESt certification (Level 3) and is currently the only building in the province certified to this level. As a result of this high level of achievement, the Natural Resources Building also received BOMA Newfoundland and Labrador's Earth Award, which is given to the building in the province which has achieved the highest level of BOMA BESt certification for the year.

Department of Natural Resources Building, St. John's, NL
Image Source: Department of Transportation and Works

- The Provincial Government has launched the Save It Forward program in provincial schools to increase awareness and positive attitudes towards energy conservation and efficiency. Through this program, students and teachers can spearhead initiatives that promote greater energy conservation and efficiency.

"Clean Air Zone" outside Confederation Building, St. John's, NL
Image Source: Office of Climate Change, Energy Efficiency and Emissions Trading

Transportation

- Since April 2008, 41 per cent of the Provincial Government's new car and SUV purchases have been hybrid vehicles. This exceeds the commitment made in the Energy Plan that 25 per cent of all new car and SUV purchases be energy-efficient or hybrid vehicles. These vehicles, 31 since April 2008 (38 in total), are spread out across the province in eight government departments.
- Government maintains clean air anti-idling zones around public buildings, which reduce GHG emissions and generate fuel-savings for vehicle owners.

Actions Going Forward –
Provincial Government Action:

The Provincial Government acknowledges the importance of leading by example and recognizes that more can be done within its own operations. Commitments going forward include:

Framework for Action

- Develop a public awareness campaign on climate change and energy efficiency with initial funding of $250,000 from Budget 2011. This campaign will promote a better understanding of climate change and energy efficiency, including the actions that people in all sectors of the economy can take.
- Develop an action plan setting out the practical steps government plans to take to green government going forward.

Green Leasing

A green lease is one that incorporates environmental sustainability principles and practices in the management and occupation of a building. The Federal Government is implementing a "green leasing" policy through which it will require a high level of energy performance at its leased properties. Beginning in April 2012, new and renewal leases will require environmental certification from programs such as LEED and BOMA.

- Explore the potential to utilize the government's procurement power to promote greater energy efficiency, lower GHG emissions and reduce waste.
- Explore the best way to ensure that individuals and businesses have access to the right information and tools to move forward on energy efficiency.
- Develop an action plan outlining government's role in transforming markets for more energy-efficient and low GHG-emitting goods and services.
- Continue to implement the Green Fund in 2011-12 and conduct an evaluation of its impact and effectiveness.
- Examine ways to enhance the delivery of energy efficiency programs across government.

Buildings

- Continue to implement the Build Better Buildings Policy.
- Conduct energy audits on government buildings in 2011-12, and complete energy audits on all remaining buildings over 1,000 square meters that have not previously been audited within the next five years.
- Develop retrofit plans for cost-effective energy efficiency upgrades that were identified in the energy audits.
- Roll out the BOMA BESt building management certification process to other government office buildings, following the successful application to the Natural Resources Building.
- Explore the potential for green leasing requirements for space that the Provincial Government leases from other building owners.
- Continue to implement the Save It Forward program in the province's schools.

Transportation

- Establish a target that 35 per cent of all new car and SUV purchases be energy-efficient or hybrid vehicles for departments, agencies, boards and commissions. This builds on the 25 per cent target from the Energy Plan.

5.2 Households

The majority of GHG emissions from households are a result of energy use for space and hot water heating, lighting and appliances, so energy efficiency remains the predominant approach to reducing GHG emissions. Focused approaches are needed for both new and existing homes. New homes are becoming more energy efficient over time and this is having an impact on energy demand in the province. For example, the total amount of energy used by the housing sector has declined since the early 1990s by approximately 17 per cent, while the total volume of housing stock has increased by 19 per cent. Despite this, there are further opportunities to reduce GHG emissions and lower household fuel bills through, for example, enhancements in building practices and using more efficient appliances. The same holds true for existing homes, which can benefit from retrofits that may, for example, increase insulation, eliminate drafts, or add energy-efficient windows.

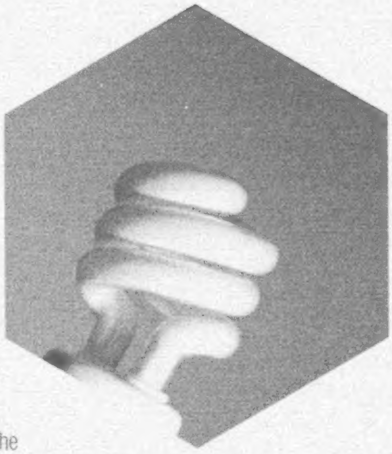
In Canada, there are many collaborative efforts occurring among the federal, provincial and territorial governments to improve energy efficiency in households. For example, governments are currently working to update the 1997 Model National Energy Code for Houses and the new version is expected to form part of the National Building Code in the fall of 2012. Newfoundland and Labrador requires that municipalities adopt the National Building Code through the *Municipalities Act, 1999*, and the inclusion of the new Model National Energy Code for Houses into the National Building Code will provide a promising opportunity to improve the energy efficiency of homes in future years.

Initiatives to Date – Households:

Progress has been made through a number of initiatives aimed at the household sector. These include:

- EnerGuide for Houses Program – The Department of Natural Resources provides $300 (plus HST) against the cost of a home energy audit and up to $1,500 to support a number of retrofits to an existing home. In April 2010, the Provincial Government announced that these programs would continue despite the fact that the Federal Government did not renew its ecoEnergy Retrofit - Homes Programs for the 2010-11 financial year. However, the Federal Government has since provided a one-year renewal of the program for 2011-12 through Budget 2011.
- Residential Energy Efficiency Program – The Newfoundland Labrador Housing Corporation maintains this program, providing lower income homeowners with funding to support retrofits to their homes. The program provides up to $3,000 to island residents, and up to $4,000 to residents in Labrador, and has benefitted approximately 1,000 homes per year. The results from the first two years of the program were positive, with average energy savings of approximately $800 annually achieved in retrofitted homes.
- Phase One of the Coastal Labrador Energy Efficiency Pilot Project - The Provincial Government has concluded Phase One of Coastal Labrador Energy Efficiency Pilot Project in the Labrador communities of Port Hope Simpson and Hopedale. In partnership with Newfoundland and Labrador Hydro, teams of energy efficiency assessors provided information and a kit of low-cost energy efficiency technologies (e.g. compact fluorescent light bulbs, weather stripping and window insulation) to households and business owners.

In addition to the actions taken by the Provincial Government, Newfoundland and Labrador Hydro and Newfoundland Power maintain the takeCHARGE program which provides customers with rebates for the installation of insulation, energy-efficient windows and high efficiency or programmable thermostats.



Action Going Forward – Households:

Energy efficiency remains a key means of helping households take action on climate change. The Provincial Government will pursue several new initiatives including:

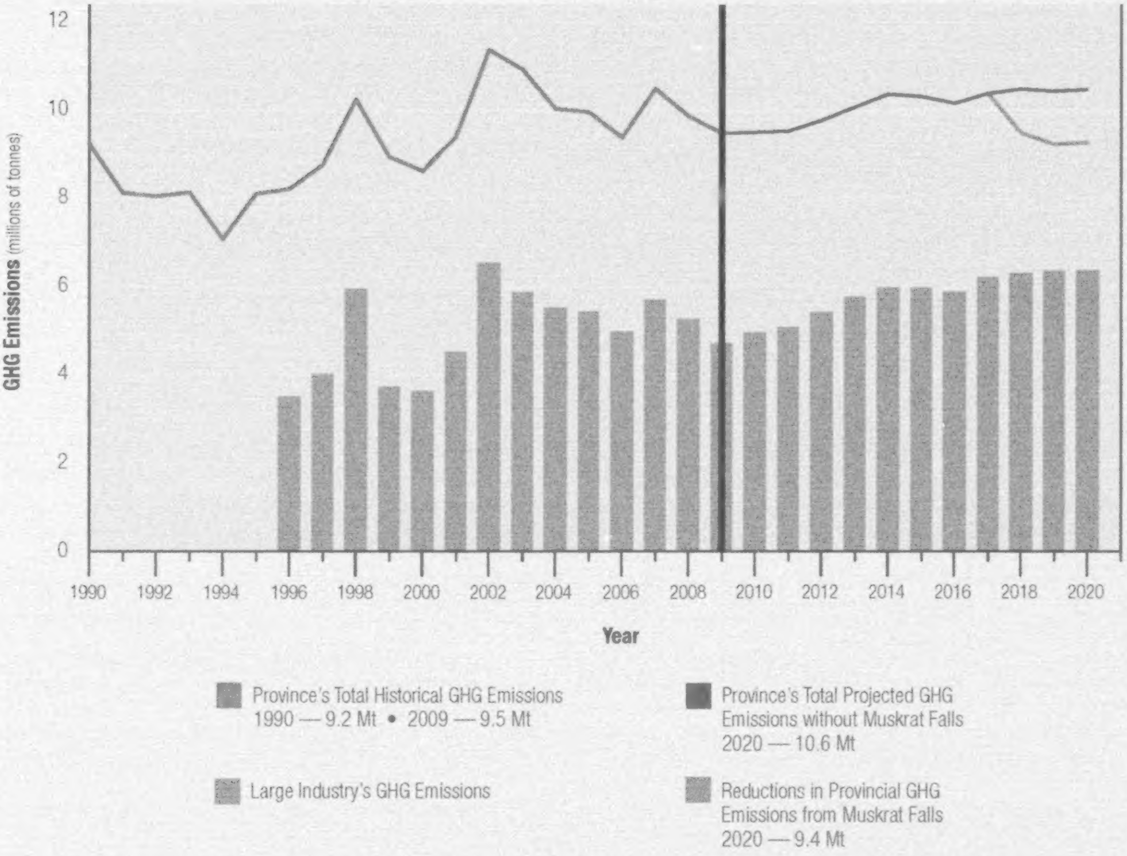
- Renew the Residential Energy Efficiency Program with an investment of $12 million over three years through Budget 2011.
- Continue to support the implementation of the EnerGuide for Homes Program.
- Work with other provinces and territories and the Federal Government on the development of long-term federal funding arrangements for residential energy efficiency retrofits.
- Launch Phase Two of the Coastal Labrador Energy Efficiency Pilot Program in two new Labrador communities and evolve the delivery model to increase the uptake of available energy efficiency programs in these communities and those visited in Phase One.
- Pilot a Building Construction Plan Energy Efficiency Advice Service for housing contractors and home-owners seeking to improve the energy efficiency of their building designs during the planning stage.
- Collaborate with other provinces, territories and the Federal Government on the development of new energy codes, energy-efficient product standards and more informative labelling.
- Work with municipalities to ensure that they are aware that the new Model National Energy Code for Houses will be incorporated into the National Building Code in 2012 and assist them to prepare for this change.

5.3 Large Industry

In the 2007 Energy Plan, the Provincial Government committed to develop a GHG Strategy for the Energy-Intensive Sector, recognizing the level of GHG emissions they release in the province. This sector currently comprises five sub-sectors, namely, electricity generation, mining, newsprint, offshore oil, and oil refining, across which there are currently nine entities operating in the province: Newfoundland and Labrador Hydro's thermal generating station at Holyrood, Iron Ore Company of Canada, Vale Inco, Wabush Mines, Corner Brook Pulp and Paper, the three offshore oil operations (Suncor, Husky and ExxonMobil), and North Atlantic Refining Limited.

In 2009, these companies were estimated to utilize 40 per cent of energy consumed in the province, and account for 50 per cent of provincial GHG emissions (42 per cent excluding the Holyrood thermal generating station). GHG emissions from this sector are expected to grow over time and, excluding Holyrood which is expected to be decommissioned with the development of Muskrat Falls, the sector is anticipated to account for 49 per cent of provincial emissions by 2020. This growth is the result of new industrial developments such as the Hebron offshore oil development, the Vale hydromet facility, new mining developments in Labrador West and expanded operations at Iron Ore Company of Canada.

Figure 4: Total historical and projected GHG emission levels in Newfoundland and Labrador with large industry share, 1990 - 2020 (millions of tonnes, Mt)



Source: Historical data from Environment Canada; projections based on internal analysis.

There are, however, important cost and competitiveness considerations when determining a way forward for this sector. These industries account for approximately 5 per cent of direct employment and about 30 per cent of GDP, and were the major driver of the 55 per cent growth in real GDP since 1990. Further, most of these firms operate internationally and are price takers in global commodities markets, so it is imperative that any approach be balanced to advance progress on climate change while promoting strong economic activity and investment.

Initiatives to Date – Large Industry:

Since the Energy Plan was released, progress has been made in a number of areas affecting the energy-intensive sector. These include:

- Newfoundland and Labrador Hydro has implemented an Industrial Energy Efficiency Program to assist large industrial operations identify opportunities for energy efficiency. Through this program, industrial firms receive financial support for an energy audit, the preparation of feasibility studies for upgrades from the audit, and up to $500,000 towards the implementation of electricity-saving measures.
- The province has developed two wind projects that are connected to the grid on the island portion of the province, in St. Lawrence and Fermeuse, with a total capacity of 54 MW. This clean energy reduces GHG emissions in the province by about 140,000 tonnes annually by displacing oil-fired electricity from Holyrood.
- The Provincial Government has been actively engaging the large industrial firms in a dialogue on the climate change agenda. These discussions have been intended to generate a mutual understanding of each other's perspectives, to identify the potential for "win-win" opportunities which meet economic and environmental goals, and to help chart a prudent path forward with a view to reducing GHG emissions while simultaneously strengthening firms' long-term competitive position in a carbon-constrained world.

Wind turbines in Fermeuse, NL
Image Source: Nalcor Energy

- In 2010, the Provincial Government commissioned a modeling study to assess the impacts of carbon pricing on each sector of the economy (see text box in section 3.4). The high-level conclusions are that, in a carbon-constrained environment in which a price is placed on GHG emissions, fuel-switching to cleaner energy sources and energy efficiency are the most promising and cost-effective opportunities for emissions reductions in the industrial and commercial sectors. A copy of this study can be found at: http://www.exec.gov.nl.ca/exec/cceeet/publications/index.html.

In addition to actions by government, Newfoundland and Labrador Hydro has implemented initiatives to reduce GHG emissions from remote electricity generation. This includes the development of the world's first completely isolated wind-hydrogen-diesel electricity generation project in the community of Ramea and the completion of phase one of a study into potential sources of alternative energy in seven coastal Labrador communities. While these reductions do not directly impact GHG emissions from the Holyrood Generating Facility (the only facility included in the GHG figures for large industry), they support the province's vision support of a clean energy future as they displace diesel generation in these communities.

Newfoundland and Labrador Hydro and Newfoundland Power have partnered in the development of a net-metering policy for customers who wish to develop alternative energy sources on a small scale. This will enable customers to produce power for themselves and have the ability to feed back some of the power into the electricity system when they produce more than they need.

Wind turbines in Ramea, NL
Image Source: Nalcor Energy

Ramea Wind-Hydrogen-Diesel Energy Project

In Ramea, an island community off the south coast of Newfoundland, excess power will be stored as chemical energy in the form of hydrogen. When it is windy, electrolysers will produce hydrogen for storage and, when it is calm, a hydrogen engine will convert the hydrogen back to electricity. The power consumption of the islanders varies, but the stored hydrogen will ensure that sufficient renewable power can be generated at any time – even when consumption is high and wind activity is minimal. As a first demonstration community, the efficient and cost-effective integration of wind power, hydrogen and diesel will be analyzed before the technology is rolled out to new communities are added. Ramea will be a model for the hydrogen economy.

Actions Going Forward – Large Industry:
The Provincial Government remains committed to working with the sector to determine an appropriate path forward on climate change that takes account of economic realities. To achieve this desired outcome the Provincial Government will:

- Pursue the development of the Muskrat Falls hydroelectric project and, through an interconnect with the island of Newfoundland, eliminate 1.2 Mt of GHG emissions from the Holyrood Generating Station.
- Develop, and publicly release in 2012, a detailed approach for the energy-intensive sector on climate change. This approach will include a GHG reduction target for the sector. The development of policies will be guided by 11 core principles:

  1. Contribute to provincial GHG reduction targets - In view of the percentage of GHG provincial emissions coming from this sector, the province will require this sector to contribute to GHG reduction efforts if it is going to meet its targets.

  2. Encourage economic development - The large industrial firms are major contributors to employment and economic activity in the province, and will be far into the future. The policies must find ways to support and sustain this activity, while achieving climate policy goals.

  3. Take account of trade-exposed nature of energy-intensive sector - The firms in this sector are largely price takers in international markets, and consideration must be given to avoid any competitive distortions that could arise through the design of a policy framework for these companies.

  4. Provide greater long-term certainty for industry - The global economy will become increasingly carbon constrained over the coming years and decades, but uncertainty about government's approach to address climate change creates risk for companies.

  5. Prepare the energy-intensive sector for a carbon-constrained future - By elaborating the intentions of the Provincial Government in a detailed policy framework, firms in this sector will have the clarity to undertake longer-term planning and investment decisions in a manner most conducive to delivering cost-effective GHG reductions.

  6. Support Lower Churchill Hydroelectric project - The Lower Churchill project is the most significant large-scale opportunity for GHG reduction in the province and region and it will generate significant economic benefits.

  7. Accommodate the unique circumstances of the offshore oil and mining sectors - Offshore oil projects have limited options to fuel-switch to cleaner energy. Mining developments located in remote areas may also have limited options to access clean electricity. As a result, any provincial framework must provide cost-effective compliance mechanisms to accommodate such unique challenges.

  8. Acceptable fiscal impacts on government - Achievement of the province's climate change policy goals must be balanced against the potential impacts that a new policy or regulatory approach could have on the provincial treasury.

  9. Encourage new investment in the province - The policy approach for large industry must continue to support inward investment and utilize the province's unique attributes (such as the availability of large quantities of clean energy) to its advantage.

10. Stimulate green technology development and deployment and job growth - GHG reduction is often driven and facilitated by green technology, whether relating to the generation of energy, improving overall energy efficiency or reducing waste. Making progress on these fronts can support technology development and new job opportunities.

11. Pursue administrative efficiency and low transaction costs - The design of a policy approach must maintain a view to administrative efficiency to ensure that the transaction costs for business and government are reasonable.

- The Provincial Government will pursue three early actions to move forward with this sector as it develops its broader policy approach. These are:

1. Become a formal observer to the Western Climate Initiative - In addition to the 11 full members of the Western Climate Initiative, there are four provinces and territories (Nova Scotia, New Brunswick, Saskatchewan and Yukon Territory), six U.S. states and six Mexican states that maintain *observer* status. Observer status allows a jurisdiction to learn more about WCI's emissions trading scheme by attending meetings and receiving analysis on the policy and operational issues being developed by member jurisdictions, without the requirement to adopt the commitments that full members are making.

2. Apply Best Available Control Technology requirements in the Air Pollution Control Regulations to GHG emissions for new investments in the large industrial sector - Currently, the regulations apply only to local air pollutants such as sulphur dioxide, and require that an owner or operator who installs a new or modified emission source employ the best available control technology to limit emissions into the atmosphere. Government will extend coverage of these requirements to include GHG emissions. This will have the effect of promoting energy efficiency and reducing GHG emissions, and will be consistent with emerging approaches such as those being advanced by the U.S. Environmental Protection Agency.

3. Seek to influence federal policy as the Federal Government considers future polices and regulations to redue GHG emissions - The Federal Government has committed to bring forward regulations to reduce emissions in the energy-intensive sector but, with the exception of regulations for coal-powered generation to come into effect in 2015, no regulations have been brought forward. The Provincial Government will ensure that the Federal Government is aware of the unique circumstances of industrial facilities in Newfoundland and Labrador.

5.4 Small and Medium-Sized Enterprises

With almost 90 per cent of businesses in Newfoundland and Labrador employing less than 20 people (Statistics Canada, Business Register, 2008), small and medium-sized enterprises (SMEs) are integral to employment and economic growth in the province.

Firms in this sector can benefit from efforts such as fuel-switching and energy efficiency where it improves their bottom line and competitive position. For example, more and more companies are being asked to provide the "carbon footprint" of their product when entering new markets, as global supply chains are increasingly interested in the environmental impact of a product throughout its lifecycle – from production to disposal. Further, energy costs are often a significant expense for businesses and increasing attention is being paid to augmenting energy efficiency in buildings and production facilities and processes. Companies that take proactive measures to lower their carbon footprint and improve their efficiency will be best positioned to take advantage of opportunities in a low-carbon global economy.

What is a Carbon Footprint?

A "carbon footprint" measures the total GHG emissions generated by an organization, product, event, or an individual. It provides a means of calculating the impact on the environment from a climate change perspective. A carbon footprint helps promote understanding of the extent and source of GHG emissions, which is often the first step in identifying how best to reduce the size of a footprint going forward. There are four types of footprints:

1. Organizational - Captures emissions from all the activities across the organization, including building energy use, industrial processes and company vehicles. An organizational footprint can be developed for any establishment (e.g. businesses, schools, not-for-profit bodies, all levels of government and households).
2. Product - Captures emissions over the whole lifecycle of a product or service, from the extraction of raw materials and manufacturing, through to its use and final reuse, recycling or disposal.
3. Event - Captures emissions associated with organizing and running an event, which may include travel, the use of building space, and waste.
4. Individual - Captures emissions associated with a person's lifestyle, such as heating a home and transportation decisions.

The Government of Newfoundland and Labrador recognizes that this sector of the economy can face barriers to action, from having sufficient resources to implement energy efficiency measures to having the in-house expertise to take action. However, there are significant opportunities to capitalize upon and government is committed to working with businesses to promote action. This includes promoting awareness on climate change and energy efficiency and the programs that are available to them, and ensuring they have access to high-quality, timely and trusted information on opportunities for fuel-switching, and ways to improve their energy efficiency and reduce their carbon footprint.

The efforts of the Provincial Government for SMEs, as with other sectors, will be supported by intergovernmental collaboration. One promising area includes federal, provincial and territorial efforts to update the 1997 Model National Energy Code for Buildings, which will apply to buildings greater than 600 m^2. This is expected to be finalized by the fall of 2011 and will provide a means to improve the energy efficiency of new commercial buildings.

Initiatives to Date – Small and Medium-Sized Enterprises:

- The Newfoundland and Labrador Green Fund has supported a wide range of climate change and GHG reduction efforts, including energy efficiency projects, small-scale wind turbines, a district heating study, and biofuel and methane capture projects.

Newfoundland and Labrador Green Fund – Support for Private and Non-Profit Sector Projects

Some of the projects that the Newfoundland and Labrador Green Fund has supported in the business and not-for-profit sectors include:

- The installation of a combined solar and wind power generating and storage system for Flowers River Lodge in Labrador. The project has the potential to reduce GHGs by 52 tonnes per year.
- The installation of an anaerobic digester and a methane gas capture and utilization system to generate electricity for New World Dairy in St. David's. This system eliminates the need for 41,000 litres of furnace oil per year and has the potential to reduce GHG emissions by over 11,000 tonnes per year.
- The installation of a wind-powered energy system to replace diesel-generated electricity for Brother Brennan Environmental Education Centre in Deer Park. This project could reduce GHG emissions by 20 tonnes per year.
- The integration of LEED design principles into the construction of the new YWCA in St. John's. The building is intended to be 25 per cent more energy efficient than the Model National Energy Code for Buildings and is expected to reduce GHG emissions by 300 tonnes annually compared to a standard building.
- A retrofit project for the Stella Burry Community Services housing and resource centre in St. John's. The Green Fund contribution supported energy efficiency measures including a heat pump system, automated controls and setback thermostats, low E windows and additional insulation in the walls and roof. In its first year of operation, the project reduced energy costs by 30 per cent and provincial GHG emissions by 31 tonnes.

Stella Burry Building, St. John's, NL
Image Source: Greg Locke photo, courtesy of Stella Burry Community Service

- The Department of Innovation, Trade and Rural Development has helped SMEs improve competitiveness through a greater focus on energy efficiency, waste reduction and the adoption of green technologies and operations. This has included "Lean and Green" workshops, delivered through the Canadian Manufacturers and Exporters Newfoundland and Labrador, which provided training and on-site demonstrations to help businesses improve productivity and lower costs. These efforts have been complemented by an expansion of the department's Business Retention and Expansion diagnostic interview program which helps SMEs identify ways to lower their carbon footprint, improve energy efficiency and reduce waste.
- The Provincial Government is studying how best to position the provincial economy and its SMEs to take advantage of opportunities in the global 'green economy', estimated to be worth approximately $5.2 trillion U.S. (GLOBE Advisors, 2010).

Green Economy – A key priority for government is ensuring the province takes advantage of the economic opportunities associated with the global transition to a low-carbon economy and greater energy efficiency. Given this, the Provincial Government is seeking to identify and maximize economic opportunities arising from the green economy. The green economy has been described in different ways by different organizations. The key point to note is that the green economy is not the same as the environmental sector, although there is overlap. Generally speaking, the green economy is taken to include economic activities such as clean and alternative energy, energy management and efficiency, environmentally friendly manufacturing and construction, cleaner transportation, waste management and recycling activities, environmental protection, and knowledge and support activities such as research and development. In Newfoundland and Labrador, the green economy was estimated to account for 5.1 per cent of economic activity and 3.4 per cent of employment in 2009. As the green economy grows and develops over time, the characteristics of "green" jobs and jobs in more traditional sectors will become increasingly similar. For example, the skills and job requirements for engineers, architects, property managers, construction workers, and information and communication specialists, among many others, are increasingly incorporating green practices such as reducing GHG emissions, saving energy and improving water efficiency.

In addition to actions by the Provincial Government, Newfoundland and Labrador Hydro, in partnership with Newfoundland Power, support commercial energy efficiency through their takeCHARGE program, which provides lighting subsidies through retailers and wholesalers. This is in addition to their program for large industrial users of electricity outlined above.

Action Going Forward - Small and Medium-Sized Enterprises:

The Provincial Government will work with businesses to support efforts that can help improve competitiveness, while contributing to the province's climate change goals. Actions will include:

- Develop a road map for businesses to help them navigate programs that could promote energy efficiency and/or action on climate change.
- Review how current business diagnostic tools support businesses in their efforts to improve energy management and understand the carbon footprints of their products and services.

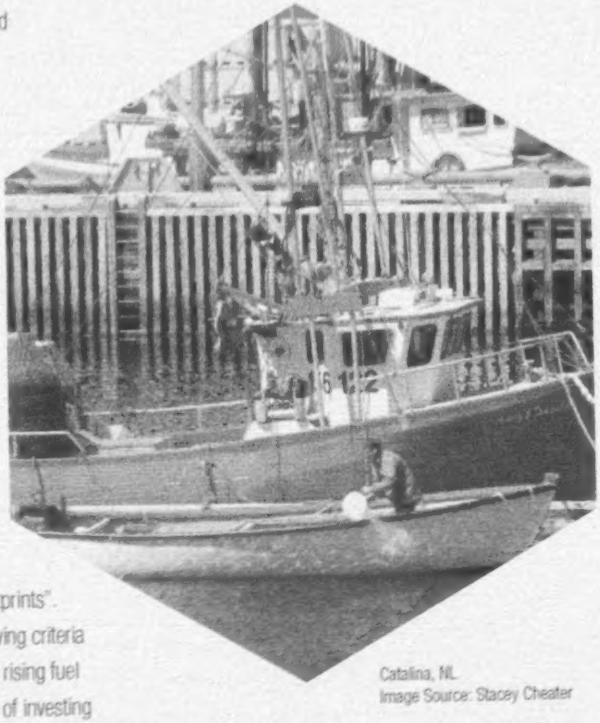
- Explore the development of incentives to increase action on energy efficiency and climate change in the private sector.
- Pilot a Building Construction Plan Energy Efficiency Advice Service for businesses seeking to improve the energy efficiency of a new building during its planning phase.
- Examine the case for adopting new national energy codes for buildings in Newfoundland and Labrador, in collaboration with key stakeholders including Municipalities Newfoundland and Labrador, the construction industry, and the design consulting and business communities.
- Collaborate with other provinces, territories and the Federal Government on the development of new energy codes, energy-efficient product standards and more informative labelling.
- Consider the findings of the Study on the Green Economy and develop a government action plan on next steps.
- Strengthen the dialogue with business on the economic development opportunities and risks associated with climate change and energy efficiency.

5.5 Fisheries and Aquaculture

The fishing and aquaculture industries are the cornerstones of rural Newfoundland and Labrador and they continue to provide a significant contribution to overall economic activity and employment in the province. Climate change and energy efficiency are issues of increasing concern to this sector. Internationally, marketplaces are increasingly looking for products from sustainable sources and these trends are evolving to also now include "low-carbon footprints". Suppliers will be required to meet those evolving criteria to maintain their markets. At the same time, rising fuel prices have increased the economic benefits of investing in energy efficiency for both harvesters and processors, as they seek to find competitive advantages and relief from fuel costs.

Actions to Date – Fisheries and Aquaculture:
The Provincial Government, often in partnership with other entities including the Fish, Food and Allied Workers, Fisheries and Marine Institute, Memorial University, the Newfoundland and Labrador Research and Development Corporation, federal departments and research centres, and the Canadian Centre for Fisheries Innovation have initiated a variety of measures to help this sector improve their energy efficiency and lower their overall carbon footprint while increasing competitiveness. Several key initiatives include:

- Launched the fishing vessel energy efficiency initiative, and projects have included fishing vessel energy efficiency workshops, fact-sheets on energy efficiency, energy-efficient shrimp trawl designs, and a three-year energy audit program.



Catalina, NL
Image Source: Stacey Cheater

Fishing Vessel Energy Audit Project

The energy audit project, part of government's fishing vessel energy efficiency initiative, is studying the fuel consumption on a variety of different fishing vessels in various operating conditions, including weather and sea states. The project is being supported by a $200,000 contribution from the Provincial Government, and is being conducted in partnership with a number of other entities including the Canadian Centre for Fisheries Innovation, the Fish, Food and Allied Workers Union, Memorial University, the Newfoundland and Labrador Research and Development Corporation, and federal departments and research centres.

- Promoted energy efficiency in the processing sector through workshops, energy audits on processing plants, and a handbook to help engineers and technical staff improve the energy efficiency of their plants.
- Established an expert advisory committee on energy efficiency in the harvesting sector, with representation from industry, academia and government departments.
- Funded a study of marine-based feedstock for the development of low-carbon biofuels. The study, by the Fisheries and Marine Institute, concluded that current levels are too low to support production, but it provided important foundational information on possible options for fish products.
- Worked with industry, Memorial University and the Fisheries and Marine Institute on reducing waste and identifying other commercial opportunities. For example, some past waste products including oils, frames and shells, that were being shipped to landfills and emitting methane, are now being used for commercial products.
- Worked with the Federal Government and industry partners on fishing vessel replacement policies as part of the Fishing Industry Renewal Strategy. These policies support access to larger and more efficient vessels.

Actions Going Forward – Fisheries and Aquaculture:

- Continue to implement the fishing vessel energy efficiency initiative, including the industry-wide promotion of fuel-saving opportunities that are being identified through the energy audit initiative.
- Explore opportunities for partnerships with industry that could promote the adoption of fuel-saving technologies in the fishery and/or reduce overall waste through the identification of new commercial products.
- Continue to support the expert advisory committee on energy efficiency in the harvesting sector.
- Engage the Federal Government on promoting fuel-efficient vessel designs that also maintain superior safety and stability for operators.
- Engage the fish processing sector on the merits of establishing an expert advisory committee on energy efficiency, as has been established for the harvesting sector.

5.6 Forestry, Agriculture and Natural Areas

Much of the discussion on reducing GHG emissions to this point has focused on reducing the use of fossil fuels through energy efficiency or fuel-switching to clean energy. However, in the forestry and agricultural sectors and the province's natural areas, there are additional implications relating to managing GHG emissions from *non-energy* sources.

Trees, soils and environmental features such as wetlands and bogs can store significant volumes of carbon dioxide. When they are disturbed, whether through commercial activity or natural events such as forest fires, significant volumes of GHG emissions can be released into the atmosphere. For these reasons, increasing attention is being paid to managing non-energy sources to either increase their ability to store carbon dioxide or preserve them to continue to act as "carbon sinks". In Newfoundland and Labrador, forests are estimated to be a net source of emissions, totalling 1 Mt in 2008. The level of emissions is lower than the early 2000s, when net emissions averaged 2 Mt.

Parks and protected areas are also increasingly recognized in their ability to sequester carbon. In Newfoundland and Labrador, there is approximately 5,455 km^2 of protected territory comprising 32 provincial parks, two wilderness reserves, 18 ecological reserves, one public reserve, and one special management area. Research has also shown that the preservation of natural areas is also helpful to climate change adaptation, as they provide ideal locations to study changes over time and can preserve naturally occurring flood protection and watersheds.

Cape St. Mary's Ecological Reserve, NL

Initiatives to Date: Forestry, Agriculture and Natural Areas:

Key actions to date by the Provincial Government include:

- The Forestry and Agrifoods Agency partnered with the Federal Government on carbon accounting models to improve measurement of the net contributions of the forest sector, including carbon stored in wood products. The agency also funded research aimed at understanding carbon changes in soils resulting from climate change, and made research on climate change one of its key priorities in its Forest Research Strategy.
- The Department of Environment and Conservation continues to develop its Natural Areas Systems Plan to complete a comprehensive system of parks and protected areas. An expanded network of protected areas will increase the total land base supporting carbon sequestration and other climate change mitigation and adaptation services. The development of the Conservation Blueprint for Labrador in partnership with Nature Conservancy of Canada will also provide baseline information for conservation planning and completion of the protected areas system in Labrador.

Actions Going Forward: Forestry, Agriculture and Natural Areas:

The Provincial Government recognizes the opportunities to manage non-energy resources in a manner that sequesters additional carbon and maintains existing sinks. The key actions over the next five years will include:

- Work with the Federal Government to improve measurement capabilities in carbon accounting models for the forestry and agriculture sectors in Newfoundland and Labrador.
- Explore the potential for changes in forest management practices to increase the carbon storage potential.

- Work with the agriculture industry to promote techniques that minimize the release of GHG emissions, including livestock, nutrient and land management, while continuing to promote industry growth and diversification.
- Include climate change issues in the consideration of a policy on commercial-scale peat mining.
- Complete the Natural Systems Plan for the province, taking into consideration possible climate change scenarios and effects during this process to inform the placement and design of new protected areas.
- Collaborate with the Federal Government, academic institutions and non-governmental organizations to advance research on carbon management in the province's natural areas.

5.7 Transportation

The transportation sector, excluding off road emissions, is responsible for approximately 31 per cent of the province's GHG emissions. Emissions from road transportation (passenger vehicles and heavy trucks) account for approximately 70 per cent of transportation emissions, with the remaining emissions coming from air, marine and rail transport.

Many provinces have sought to reduce GHG emissions from the transportation sector, but achieving progress has been challenging. Economic growth is often accompanied by an increased demand for transportation services, which can lead to more vehicles on the roads and more planes in the air. There has been significant technological progress in recent decades on low-emission vehicles, such as hybrids and alternative fuels, but mainstream adoption of these technologies will take time. The Federal Government has worked in partnership with the United States to improve the efficiency of passenger and light-duty trucks, and these regulations are expected to reduce natural GHG emissions by 92 Mt by 2016. In addition, the Federal Government recently completed regulations that will require higher amounts of renewable fuels in gasoline. These regulations are expected to lower national GHG emissions by 4 Mt annually.

Hybrid and Electric Vehicles

There is innovation occurring in the global vehicle market that is promising significant energy and GHG savings - the development of hybrid and all-electric vehicles. Hybrid vehicles use two sources of power, a conventional engine and a battery that is re-charged when the vehicle is in motion. Some hybrid models provide a plug-in option that can enable the owner to re-charge the vehicle from an outlet. These vehicles offer GHG savings over traditional vehicles as they do not always need to rely on the combustion of carbon-based fuels. Hybrid vehicles are beginning to share the marketplace with electric vehicles that rely solely on battery power. These vehicles can greatly reduce GHG emissions, but only when the electricity is generated from a clean energy source such as hydroelectricity or wind. The potential GHG benefits are not realized when the electricity is generated from carbon-intensive fuels such as coal, as GHGs are just emitted at the power station rather than on the road.

These are unique challenges in Newfoundland and Labrador with respect to the transportation sector. Newfoundland and Labrador is the most rural province in Canada, with 50 per cent of the population living in rural locations. Its largest centres do not have sufficient population to support mass transit options such as rail and the provincial population is too small to support unique vehicle efficiency standards. In addition, biofuels are not readily available in sufficiently large quantities to power the province's vehicles. As a result, GHG savings in the transportation sector will largely depend on individual decisions concerning means of transportation, vehicle purchases, driving habits and distance traveled, for the foreseeable future.

Initiatives to Date – Transportation:

The Provincial Government has supported a number of initiatives to reduce GHG emissions from road transportation. They include:

- $1.57 million in Green Fund support for the St. John's Cycling Master Plan, which comprises a series of measures to promote cycling and reduce car use in the city. The estimated reduction is 1,900 tonnes of GHGs annually.
- $85,400 in Green Fund support for Metrobus public transit in St. John's to install hybrid devices on six of its buses. The devices provide electric power to various engine components and eliminate the need to rely on the traditional diesel engine. The estimated reduction is 67 tonnes of GHGs annually.
- $28,000 in Green Fund support for an awareness campaign by Metrobus public transit in St. John's. The estimated reduction is 40 tonnes of GHGs annually.

Additional efforts to reduce GHG emissions from transportation have focused on the Provincial Government's own operations and support for fishing vessels, as elaborated previously.

Freight transportation in Labrador
Image Source: Chris P. Sampson

Action Going Forward – Transportation:

The Provincial Government will pursue a number of measures to lower GHG emissions in the transportation sector, including:

- Collaborate with the Federal Government and other provinces and territories on the development and implementation of strengthened efficiency standards for light and heavy-duty vehicles, and better energy efficiency labelling on vehicles for consumers.
- Collaborate with industry to explore opportunities to improve the energy efficiency of heavy trucks.
- Engage the Federal Government to ensure its funding programs for fuel-efficient technology on heavy trucks can support small trucking operations like those often found in Newfoundland and Labrador.
- Review new driver training material and examinations for opportunities to strengthen driver knowledge on fuel-saving opportunities.
- Continue to support the implementation of the federal, provincial and territorial agreement on vehicle weights and dimensions, which sets the underlying framework for the adoption of many fuel-saving practices for heavy trucks.
- Collaborate with partners through the Conference of New England Governors and Eastern Canadian Premiers to continue studying the costs and benefits of a low-carbon fuel standard for the region.
- Examine the state of technology, infrastructure requirements and market developments for electric vehicles.

5.8 Waste

The waste sector is responsible for 7 per cent of GHG emissions in Newfoundland and Labrador. The vast majority of GHG emissions are generated from organic waste in landfills (approximately 30 per cent of all waste), which creates methane when it decays without the presence of oxygen. However, the entire "carbon footprint" of waste can be much larger when including the GHGs that are generated from the production, transportation and disposal of the waste item.

Reducing waste is a challenge across the globe as higher populations and economic growth are most often accompanied by higher volumes of waste. Effective waste management relies on a number of factors including individual awareness and decision-making, community and provincial infrastructure, effective regulation and the availability of recycling and composting services. Like the broader effort on climate change, waste management is a shared challenge that cannot be addressed by one sector or level of government alone.

Waste management has clear environmental benefits, but it can also present unique economic opportunities. There are global markets for recycled products and compost, new technologies to capture methane and generate electricity, and cost savings to be realized for communities and businesses that reduce their total volume of waste material.

Initiatives to Date – Waste:

In May 2007, the Provincial Government announced the $200 million implementation plan for its Solid Waste Management Strategy, which was originally released in 2002. This comprehensive strategy is intended to establish modern waste management practices in the province by:

- Diverting 50 per cent of the materials currently going to landfills;
- Reducing the number of waste disposal sites by 80 per cent;
- Eliminating open burning and phasing out incinerators; and
- Phasing out unlined landfill sites.

Significant advances in solid waste management are now being made and the majority of the population will be participating in modern waste management systems by 2012. It is expected that full implementation of the strategy will occur by 2020.

The major pillars supporting the implementation of this strategy are: (1) capital funding for new waste management infrastructure and materials recovery facilities; (2) collaboration with regional and sub-regional entities to develop waste management solutions; and (3) enhanced awareness and education to drive waste reduction by businesses and the general public.

The Provincial Government and its municipal partners are moving forward on the implementation of this strategy. Several of the key completed and ongoing initiatives include:

- Completion of the Material Recovery Facility at the Robin Hood Bay Regional Waste Management Facility in St. John's, which provided the eastern region with the opportunity to implement curb-side recycling and divert a large portion of waste from the landfill.
- Implementation of methane capture technology at the Robin Hood Bay Regional Waste Management Facility, with funding provided through the Provincial Government's Green Fund. This project has the potential to reduce GHG emissions up to 60,000 tonnes annually.
- Construction of the full-service waste management facility in Norris Arm North, as well as seven transfer stations, to support modern waste management in the central region.
- Ongoing study to determine the type and location for full-service waste management for the western region on the island of Newfoundland.
- Funding for various communities to purchase new waste collection vehicles to support consolidated waste collection services and recycling.

Image Source: Multi-Materials Stewardship Board

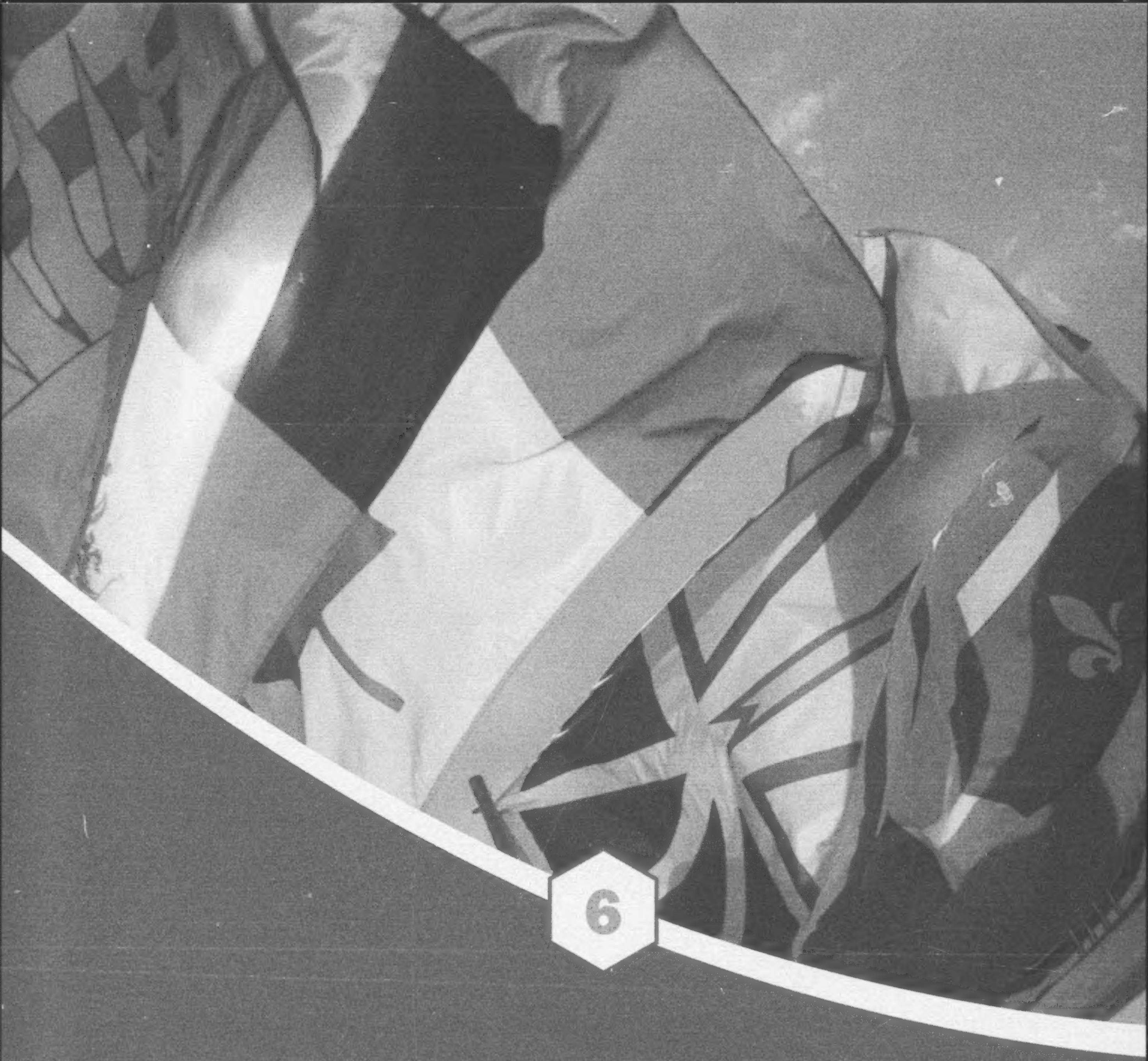
The Multi-Materials Stewardship Board (MMSB) has been a key partner with the Provincial Government in moving forward modern waste management in the province. Its flagship program is the Used Beverage Container Recycling Program. A recent carbon footprint analysis showed that the recycling of these containers has seen a reduction in 8,700 tonnes of GHGs associated with the manufacturing of new containers. This program, as well as other efforts targeted at tires, paper and composting, diverted over 15,000 tonnes of waste from provincial landfills in 2009.

The MMSB has also supported a suite of other initiatives to support modern waste management including the Get to Half public awareness campaign, school and business outreach efforts, and information and advice on household and community composting which can greatly reduce methane generation in the province's landfills. The MMSB also works collaboratively with other provinces and territories on Extended Producer Responsibility, to drive greater action by manufacturers to design products that create less waste and cost less to manage during their end-of-life disposal. The MMSB is currently working with industry to develop Extended Producer Responsibility programs for waste paint, electronic waste, waste pharmaceuticals and medical sharps.

Actions Going Forward – Waste:

The Provincial Government is committed to modern waste management in the province and will continue to identify opportunities for GHG reduction. The Provincial Government will:

- Continue implementation of the Provincial Solid Waste Management Strategy.
- Study opportunities for methane capture in landfill sites, building on success of the project implemented at the Robin Hood Bay Regional Waste Management Facility.
- Promote opportunities for community composting projects, which can reduce material going to landfills.
- Continue education and awareness raising efforts through the MMSB, including through the Get to Half Program and continued school engagement and the establishment of "Green Teams" in the province's business community.
- Collaborate with other jurisdictions through the Canadian Council of Ministers of the Environment to advance Extended Producer Responsibility programs in Canada.



6

LEVERAGING INTERGOVERNMENTAL PARTNERSHIPS

6.0 LEVERAGING INTERGOVERNMENTAL PARTNERSHIPS

The Government of Newfoundland and Labrador has worked actively with the Federal Government and other jurisdictions to advance action on climate change. Through these efforts, government is able to advance the province's interests, leverage the expertise of other jurisdictions, and identify areas where national or regional action is the optimal way forward.

Canadian Premiers have sought to drive forward collaborative action on climate change, in some cases in partnership with U.S. Governors and the Federal Government. The Council of the Federation, Conference of New England Governors and Eastern Canadian Premiers, and various Ministerial forums, including the Council of Energy Ministers, the Canadian Council of Ministers of the Environment, Council of Ministers Responsible for Transportation and Highway Safety, Canadian Council of Forest Ministers and Forum of Ministers Responsible for Local Government, have worked together on initiatives to tackle climate change.

Gros Morne, NL
Image Source: ©Barrett & MacKay Photo, courtesy of the Department of Tourism, Culture and Recreation

Collaboration with the Atlantic provinces has been a particular priority for the Provincial Government on issues ranging from clean energy development, as witnessed by the historic signing of the Muskrat Falls partnership agreement, to other areas including fisheries and aquaculture, transportation and procurement. This work is supported by a variety of bodies including the Council of Atlantic Premiers, Council of Atlantic Environment Ministers, Atlantic Energy Ministers and Atlantic Council of Fisheries and Aquaculture Ministers.

The Federal Government is an important partner in taking action on climate change as it has jurisdiction over a number of key policy areas and has the resources to support nationally focused initiatives. For example, the Federal Government establishes energy-use standards for appliances, sets fuel-efficiency standards for passenger vehicles and heavy trucks, and maintains the largest network of climate monitoring stations in Canada. It also supports targeted initiatives like the Newfoundland and Labrador Green Fund and the Atlantic Climate Adaptation Solutions initiative through its national programs.

One of the goals established by the Provincial Government in this plan is the need to collaborate with other governments to drive forward action on climate change. As the previous pages have illustrated, a number of commitments have been made which support the achievement of that goal. These are summarized in the Strategic Framework in section 8.0.

Moving forward, the Provincial Government will continue to proactively engage other governments to identify opportunities for collaboration on climate change.

Torngat Mountains, NL
Image Source: ©Barrett & MacKay Photo, courtesy of the Department of Tourism, Culture and Recreation

7

MEASURING PROGRESS

7.0 MEASURING PROGRESS

Responding to climate change is a challenging endeavour and, as the preceding pages make clear, it will require the use of a blend of policy instruments ranging from information campaigns and incentives, to regulations and intergovernmental collaboration.

This Climate Change Action Plan is a government-wide plan, but the specific action items are the responsibility of individual departments, offices, and agencies. The goals, objectives and action items outlined in this plan are the current priorities for action, but this plan is designed to be flexible so that it may incorporate additional actions in the future.

As this Climate Change Action Plan is implemented several efforts will be utilized to track and report on progress:

- The Office of Climate Change, Energy Efficiency and Emissions Trading will develop an Accountability Framework to support the internal performance measurement process, in consultation with interested departments. The Accountability Framework will confirm the departments' roles and responsibilities under this Climate Change Action Plan, establish annual performance measures and targets, determine the performance monitoring and reporting requirements, and assess the need for and timing of any program evaluations.
- The Premier will table a written statement each year in the House of Assembly outlining progress to date.
- A report will be published halfway through the five-year plan and again at the end outlining progress on the commitments in this plan.
- Established processes, such as the regular monitoring and periodic evaluation of programs, will be utilized to document the impact of departmental initiatives.

Witless Bay, NL

Cape Spear, NL

8

STRATEGIC FRAMEWORK

Climate Change Action Plan

8.0 STRATEGIC FRAMEWORK - CLIMATE CHANGE ACTION PLAN

Vision	*A province that effectively integrates progressive action on climate change into its policy, planning and programs in a way that supports future economic, social and environmental success.*
Guiding Principles	• *Promote province and economy-wide action*, recognizing the need for all sectors of the economy to play their part in tackling climate change. • *Identify and maximize opportunities*, such as the development of the province's clean energy resources, improving competitiveness, promoting energy efficiency and developing new technologies. • *Understand and minimize risk*, particularly those associated with the potential impacts of climate change including stronger storm surges, sea-level rise and reduced winter sea ice. • *Utilize a blend of policy instruments*, recognizing that effective action on climate change requires the use of multiple approaches ranging from information campaigns to regulation. • *Support collaboration and partnerships*, to utilize the experience and expertise that is readily available in the public, private, academic and non-governmental sectors in Newfoundland and Labrador.
Goal 1	**Enhance Newfoundland and Labrador's resilience to the impacts of climate change**
Objective 1.1	Strengthen the understanding of the impacts of climate change on the province
Action Items	• Collaborate with other governments and the research and academic community with a view to strengthening long-term climate forecasting for the province. • Consider the findings of the study on climate change monitoring capabilities in the province and next steps. • Collaborate with the Federal Government to strengthen climate monitoring networks and information on local precipitation trends to support infrastucture design. • Continue to strengthen the Newfoundland and Labrador Water Resources Portal and work to identify additional sources of information that can be digitized and made publicly available through this Geographic Information System. • Continue to implement the Forest Research Strategy which has a strategic focus on better understanding the impacts of climate change on forests in the province.

	• Work with the academic and research community to develop research priorities and enhance the dialogue on the impacts of climate change in Newfoundland and Labrador. Northern Labrador • Identify research needs on climate change in northern Labrador and work with other partners to consider the best way to address them. • Identify ways to better engage northern Labrador communities on issues pertaining to climate change adaptation.
Objective 1.2	Improve the integration of climate change adaptation into decision-making.
Action Items	• Continue to implement the ACAS project and partner with Municipalities Newfoundland and Labrador and Professional Municipal Administrators to roll out the findings to all communities. • With a $600,000 annual investment over three years through Budget 2011, establish new flood risk maps for at-risk locations and, where it is possible to predict flooding, alert systems to notify government, communities and emergency response personnel of potential flooding. The new maps will incorporate climate change predictions to enhance their ability to support informed decisions and community planning. • With a $100,000 annual investment over three years through Budget 2011, establish a new Coastal Erosion Monitoring and Mapping Program and make the data and reports available through the Newfoundland and Labrador Water Resources Portal and other publications. • Continue to include consideration of climate change implications (e.g. potential for flooding) in the site selection and design of Provincial Government buildings and infrastructure and extend these considerations to those receiving public funding. • Continue to implement and enforce the Land Use Policy for Flood Risk Areas. • Analyze opportunities to incorporate climate change considerations into community planning efforts, with a view to identifying opportunities for synergies across planning processes and minimizing administrative burden. • Continue to support communities in their preparation of Emergency Management Plans, which are due by May 2012. Northern Labrador • Promote best practices in community development in the north through appropriate planning and building practices to support long-term sustainability.

	• Identify ways in which decision-making tools on climate change in northern Labrador could be improved, such as climate observation networks, flood risk mapping and information on local ice conditions. • Share expertise and information with a view to supporting the shared future directions and plans of the Nunatsiavut Government, Innu Nation and Provincial Government.
Goal 2	**Reduce greenhouse gas emission levels in Newfoundland and Labrador**
Objective 2.1	Pursue the greenhouse gas (GHG) reduction targets of the Conference of New England Governors and Eastern Canadian Premiers on a provincial basis: 10 per cent below 1990 levels by 2020 and 75-85 per cent below 2001 levels by 2050.
Action Items	**Provincial Government** The actions to be taken by the Provincial Government that will contribute to this objective are outlined under Goal 3. **Households** • Renew the Residential Energy Efficiency Program with an investment of $12 million over three years through Budget 2011. • Continue to support the implementation of the EnerGuide for Homes Program. • Work with other provinces and territories to encourage the Federal Government to develop long-term federal funding arrangements for residential energy efficiency retrofits. • Launch Phase Two of the Coastal Labrador Energy Efficiency Pilot Program in two new Labrador communities and evolve the delivery model to increase the uptake of available energy efficiency programs in these communities and those visited in Phase One. • Pilot a Building Construction Plan Energy Efficiency Advice Service for housing contractors and homeowners seeking to improve the energy efficiency of their building designs during the planning stage. • Collaborate with other provinces, territories and the Federal Government on the development of new energy codes, energy-efficient product standards and more informative labeling. • Work with municipalities to ensure that they are aware that the new Model National Energy Code for Houses will be incorporated into the National Building Code in 2012 and assist them to prepare for this change.

Large Industry

- Pursue the development of the Muskrat Falls hydroelectric project and, through an interconnect with the island of Newfoundland, eliminate 1.2 Mt of GHG emissions from the Holyrood Generating Station.
- Develop, and publicly release in 2012, a detailed approach for the energy-intensive sector on climate change. This approach will include a GHG reduction target for the sector. The development of policies will be guided by 11 core principles:
  - Contribute to provincial GHG reduction targets
  - Encourage economic development
  - Take account of trade-exposed nature of energy-intensive sector
  - Provide greater long-term certainty for industry
  - Prepare the energy-intensive sector for a carbon-constrained future
  - Support Lower Churchill Hydroelectric project
  - Accommodate the unique circumstances of the offshore oil and mining sectors
  - Acceptable fiscal impacts on government
  - Encourage new investment in the province
  - Stimulate green technology development and deployment and job growth
  - Pursue administrative efficiency and low transaction costs

- The Provincial Government will pursue three early actions to move forward with this sector as it develops its broader policy approach. These are:
  - Become a formal observer to the Western Climate Initiative
  - Apply Best Available Control Technology requirements in the Air Pollution Control Regulations to greenhouse gas emissions for new investments in the large-industrial sector
  - Seek to influence federal policy as the Federal Government considers future policies and regulations to reduce GHG emissions.

Small and Medium-Sized Enterprises

- Develop a road map for businesses to help them navigate programs that could promote energy efficiency and/or action on climate change.
- Review how current business diagnostic tools support businesses in their efforts to improve energy management and understand the carbon footprints of their products and services.

- Explore the development of incentives to increase action on energy efficiency and climate change in the private sector.
- Pilot a Building Construction Plan Energy Efficiency Advice Service for businesses seeking to improve the energy efficiency of a new building during its planning phase.
- Examine the case for adopting new national energy codes for buildings in Newfoundland and Labrador, in collaboration with key stakeholders including Municipalities Newfoundland and Labrador, the construction industry, and the design consulting and business communities.
- Collaborate with other provinces, territories and the Federal Government on the development of new energy codes, energy-efficient product standards and more informative labelling.
- Consider the findings of the Study on the Green Economy and develop a government action plan on next steps.
- Strengthen the dialogue with business on the economic development opportunities and risks associated with climate change and energy efficiency.

Fisheries and Aquaculture

- Continue to implement the fishing vessel energy efficiency initiative, including the industry-wide promotion of fuel-saving opportunities that are being identified through the energy audit initiative.
- Explore opportunities for partnerships with industry that could promote the adoption of fuel-saving technologies in the fishery and/or reduce overall waste through the identification of new commercial products.
- Continue to support the expert advisory committee on energy efficiency in the harvesting sector.
- Engage the Federal Government on promoting fuel-efficient vessel designs that also maintain superior safety and stability for operators.
- Engage the fish processing sector on the merits of establishing an expert advisory committee on energy efficiency, as has been established for the harvesting sector.

Forestry, Agriculture and Natural Areas

- Work with the Federal Government to improve measurement capabilities in carbon accounting models for the forestry and agriculture sectors in Newfoundland and Labrador.
- Explore the potential for changes in forest management practices to increase the carbon storage potential.

- Work with the agriculture industry to promote techniques that minimize the release of GHG emissions, including livestock, nutrient and land management, while continuing to promote industry growth and diversification.
- Include climate change issues in the consideration of a policy on commercial-scale peat mining.
- Complete the Natural Systems Plan for the province, taking into consideration possible climate change scenarios and effects during this process to inform the placement and design of new protected areas.
- Collaborate with the Federal Government, academic institutions and non-governmental organizations to advance research on carbon management in the province's natural areas.

Transportation

- Collaborate with the Federal Government and other provinces and territories on the development and implementation of strengthened efficiency standards for light and heavy-duty vehicles, and better energy efficiency labelling on vehicles for consumers.
- Collaborate with industry to explore opportunities to improve the energy efficiency of heavy trucks.
- Engage the Federal Government to ensure its funding programs for fuel-efficient technology on heavy trucks can support small trucking operations like those often found in Newfoundland and Labrador.
- Review new driver training material and examinations for opportunities to strengthen driver knowledge on fuel-saving opportunities.
- Continue to support the implementation of the federal, provincial and territorial agreement on vehicle weights and dimensions, which sets the underlying framework for the adoption of many fuel-saving practices for heavy trucks.
- Collaborate with partners through the Conference of New England Governors and Eastern Canadian Premiers to continue studying the costs and benefits of a low carbon fuel standard for the region.
- Examine the state of technology, infrastructure requirements and market developments for electric vehicles.

Waste

- Continue implementation of the Provincial Solid Waste Management Strategy.
- Study opportunities for methane capture in landfill sites, building on success of the project implemented at the Robin Hood Bay Regional Waste Management Facility.

	• Promote opportunities for community composting projects, which can reduce material going to landfills. • Continue education and awareness-raising efforts through the MMSB, including through the Get to Half Program and continued school engagement and the establishment of "Green Teams" in the province's business community. • Collaborate with other jurisdictions through the Canadian Council of Ministers of the Environment to advance Extended Producer Responsibility programs in Canada.
Goal 3	**Demonstrate Provincial Government leadership on climate change**
Objective 3.1	Promote economy-wide action on climate change through policies and measures designed to facilitate widespread engagement and action; and manage government's own operations in a manner consistent with this plan.
Action Items	**Framework for Action** • Develop a public awareness campaign on climate change and energy efficiency with initial funding of $250,000 from Budget 2011. This campaign will promote better understanding of climate change and energy efficiency, including the actions that people in all sectors of the economy can take. • Develop an action plan setting out the practical steps government plans to take to green government going forward. • Explore the potential to utilize the government's procurement power to promote greater energy efficiency, lower GHG emissions and reduce waste. • Explore the best way to ensure that individuals and businesses have access to the right information and tools to move forward on energy efficiency. • Develop an action plan outlining government's role in transforming markets for more energy-efficient and low GHG-emitting goods and services. • Continue to implement the Green Fund in 2011-12 and conduct an evaluation of its impact and effectiveness. • Examine ways to enhance the delivery of energy efficiency programs across government. **Buildings** • Continue to implement the Build Better Buildings Policy. • Conduct energy audits on government buildings in 2011-12, and complete energy audits on all remaining buildings over 1,000 m^2 that have not previously been audited within the next five years. • Develop retrofit plans for cost-effective energy efficiency upgrades that were identified in the energy audits.

	• Roll out the BOMA BESt building management certification process to other government office buildings, following the successful application to the Natural Resources Building. • Explore the potential for green leasing requirements for space that the Provincial Government leases from other building owners. • Continue to implement the Save It Forward program in the province's schools. **Transportation** • Establish a target that 35 per cent of all new car and SUV purchases be energy-efficient or hybrid vehicles for departments, agencies, boards and commissions. This builds on the 25 per cent target from the Energy Plan.
Goal 4	**Advance action on climate change through collaboration with other governments**
Objective 4.1	Proactively engage other governments to identify opportunities for collaboration on climate change.
Action Items	The following commitments have been highlighted previously in their respective section, but are repeated here to bring focus to the need to work with other levels of government on climate change. **Households** • Collaborate with other provinces, territories and the Federal Government on the development of new energy codes, energy-efficient product standards and more informative labelling. • Work with municipalities to ensure that they are aware that the new Model National Energy Code for Houses will be incorporated into the National Building Code in 2012 and assist them to prepare for this change. • Work with other provinces and territories to encourage the Federal Government to develop long-term federal funding arrangements for residential energy efficiency retrofits. **Large Industry** • Pursue the development of the Muskrat Falls hydroelectric project and, through an interconnect with the island of Newfoundland, eliminate 1.2 Mt of GHG emissions from the Holyrood Generating Station. • Work with the Federal Government to ensure that they have information on the unique circumstances of facilities and industries in Newfoundland and Labrador as they consider future policies and regulations to reduce GHG emissions

Small and Medium-Sized Enterprises

- Examine the case for adopting new national energy codes for buildings in Newfoundland and Labrador, in collaboration with key stakeholders including Municipalities Newfoundland and Labrador, the construction industry, and the design consulting and business communities.
- Collaborate with other provinces, territories and the Federal Government on the development of new energy codes, energy-efficient product standards and more informative labelling.

Fisheries and Aquaculture

- Engage the Federal Government on promoting fuel-efficient vessel designs that also maintain superior safety and stability for operators.

Forestry, Agriculture and Natural Areas

- Work with the Federal Government to improve measurement capabilities in carbon accounting models for the forestry and agriculture sectors in Newfoundland and Labrador.
- Collaborate with the Federal Government, academic institutions and non-governmental organizations to advance research on carbon management in the province's natural areas.

Transportation

- Collaborate with the Federal Government and other provinces and territories on the development and implementation of strengthened efficiency standards for light and heavy-duty vehicles, and better energy efficiency labelling on vehicles for consumers.
- Engage the Federal Government to ensure its funding programs for fuel-efficient technology on heavy trucks can support small trucking operations like those often found in Newfoundland and Labrador.
- Continue to support the implementation of the federal, provincial and territorial agreement on vehicle weights and dimensions, which sets the underlying framework for the adoption of many fuel-saving practices for heavy trucks.
- Collaborate with partners through the Conference of New England Governors and Eastern Canadian Premiers to continue studying the costs and benefits of a low carbon fuel standard for the region.

Waste

- Collaborate with other jurisdictions through the Canadian Council of Ministers of the Environment to advance Extended Producer Responsibility programs in Canada.

	Climate Change Adaptation • Collaborate with other governments and the research and academic community with a view to strengthening long-term climate forecasting for the province. • Consider the findings of the study on climate change monitoring capabilities in the province and next steps. • Collaborate with the Federal Government to strengthen climate monitoring networks and information on local precipitation trends to support infrastructure design. • Analyze opportunities to incorporate climate change considerations into community planning efforts, with a view to identifying opportunities for synergies across planning processes and minimizing administrative burden. **Climate Change Adaptation in Northern Labrador** • Identify ways to better engage northern Labrador communities on issues pertaining to climate change adaptation. • Promote best practices in community development in the north through appropriate planning and building practices to support long-term sustainability. • Identify ways in which decision-making tools on climate change in northern Labrador could be improved, such as climate observation networks, flood risk mapping and information on local ice conditions. • Identify research needs on climate change in northern Labrador and work with other partners to consider the best way to address them. • Share expertise and information with a view to supporting the shared future directions and plans of the Nunatsiavut Government, Innu Nation and provincial government.

ANNEX 1: Acronyms and Glossary

Acronyms

ACAS	Atlantic Climate Adaptation Solutions Initiative
BOMA BESt	Building Owners and Managers Association Building Environment Standards
CAP	Council of Atlantic Premiers
COF	Council of the Federation
EPA	Environmental Protection Agency (U.S.)
GHG	Greenhouse Gas
GDP	Gross Domestic Product
ICLEI	International Council for Location Environmental Initiatives
IOC	Iron Ore Company of Canada
IDF	Intensity-Duration-Frequency
IPCC	Intergovernmental Panel on Climate Change
LEED	Leadership in Energy and Environmental Design
MMSB	Multi-Materials Stewardship Board
Mt	Million tonnes
NEG-ECP	Conference of New England Governors and Eastern Canadian Premiers
PIEVC	Public Infrastructure Engineering Vulnerability Committee
R&D	Research and development
SMEs	Small and Medium-Sized Enterprises
TWh	Terrawatt hours
UNFCCC	United Nations Framework Convention on Climate Change
WCI	Western Climate Initiative

Terms

Adaptation – Actions to plan for and respond to the impacts of climate change, including measures taken by governments, communities and businesses to, among other things, monitor natural resources, protect species and ecosystems, build community capacity and upgrade infrastructure.

Cap and Trade – See Emissions Trading.

Carbon Footprint – The amount of greenhouse gas emissions generated by an organization, product, event or person, including direct emissions such as burning fossil fuels, indirect emissions such as electricity consumption, and embedded emissions such as emissions generated through the production of a good or service.

Carbon Sinks – An area of land or water that can absorb and store carbon dioxide from the atmosphere. Forests are the most common form of carbon sink, as well as soils, peat, permafrost, ocean water and carbonate deposits in the deep ocean. With changes in conditions (e.g. temperature, precipitation, and natural or man-made disturbances), a carbon sink can become a carbon source, in other words it can release carbon dioxide into the atmosphere.

For example, a growing forest is a carbon sink as it absorbs more carbon than it releases, but if the forest burns down or is destroyed by pests, it becomes a carbon source as it releases the stored carbon into the atmosphere.

Carbon Taxes – Taxes which are placed on fuels that emit greenhouse gases when consumed. Within Canada, British Columbia (at the retail level) and Quebec (at the fuel distributor level) have levied carbon taxes on fuels such as gasoline and diesel. Carbon taxes provide an incentive to consumers to improve their energy efficiency or switch to alternative fuel types. They can be levied in a way that makes them revenue neutral – i.e. other taxes are reduced to compensate for the carbon tax.

Conference of New England Governors and Eastern Canadian Premiers – This is a forum of Premiers from Newfoundland and Labrador, Quebec, Nova Scotia, New Brunswick and Prince Edward Island, and Governors from Massachusetts, Maine, New Hampshire, Rhode Island, Vermont and Connecticut. Premiers and Governors meet annually address various cross-border issues including energy and transmission, climate change and air quality, trade and export development and border security.

Council of Atlantic Premiers – This is a forum of Premiers from Newfoundland and Labrador, Nova Scotia, New Brunswick and Prince Edward Island. Premiers meet regularly and discuss issues of mutual concern, including energy development, transportation and infrastructure, health and wellness and the environment. Premiers have also undertaken several trade and export development missions within North America.

Council of the Federation – This is a forum of all Canadian Premiers and Territorial Leaders. It meets annually to address key issues in Canada including the economy, energy, transportation, international and intra-provincial trade, health and emergency preparedness and climate change.

Emissions Trading – Commonly referred to as "cap-and-trade", this is a regulatory regime that sets limits on certain industries' or facilities' annual greenhouse gas emissions, and requires firms to obtain tradable credits to cover their emission levels. Given that climate change is a global problem and the environmental effect of reducing emissions is the same wherever the reductions take place, it makes sense to reduce emissions where the cost is lowest. Emissions trading allows regulated entities greater flexibility than standard regulation as it allows them to choose between reducing their own emissions at the facility or buying allowances from another entity that has reduced its emissions below its target and therefore has surplus credits to sell. All other things being equal, the regulated entity will buy credits if this is cheaper than investing in on-site reductions. Trading systems often permit the use of "offset credits", which are credits generated by GHG-reducing projects in sectors that are not subject to the emissions trading regulation, such as forestation.

Energy Conservation – Refers to measures that seek to alter the behaviour of individuals by encouraging them to reduce energy consumption, including switching off lights when leaving a room, turning off televisions or computers when not in use, or lowering thermostat settings at night.

Energy Efficiency – Refers to using less energy to provide the same level of energy service. In residential homes, increasing insulation or buying high-efficiency appliances can allow householders to reduce their energy consumption and thereby save money while maintaining the same level of comfort. In the industrial sector, new technology investments and processes may save energy while maintaining or increasing the level of production.

Energy-Intensive Sector – Industrial firms and power generators that require large amounts of energy to produce and transport their products and services. In Newfoundland and Labrador, this includes the operations of large industrial firms such as North Atlantic Refinery Limited, Corner Brook Pulp and Paper, Wabush Mines, Iron Ore Company of Canada, Vale Inco, ExxonMobil, Husky Energy, Suncor and Nalcor.

Fuel-switching – The substitution of one type of fuel for another. For example, the substitution of carbon-intensive fuels, such as diesel, with lower GHG-emitting fuels, such as hydroelectricity.

Greenhouse Effect – The process whereby some of the heat reflected by the Earth's surface is trapped by naturally occurring greenhouse gases in the atmosphere keeping the Earth's temperature hospitable.

Greenhouse Gases – Gases that are responsible for climate change and which may be released by natural processes or human activity. The six gases covered by the Kyoto Protocol are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). The majority of GHGs come from the combustion of fossil fuels, but 'non-energy' sources of GHGs such as those emitted from waste (methane from decaying material), agriculture (nitrous oxide from fertilizers or methane from cattle) and deforestation (carbon dioxide from trees) can account for large amounts of GHGs in some locations.

Green Leasing – A lease between a landlord and tenant that incorporates environmental sustainability principles and practices in the management and occupation of a building or facility. From the landlord's perspective, a green lease provides the advantages of reducing the building's environmental footprint, generating cost savings and enhancing social and environmental reputation. From the tenant's perspective, a green lease results in cost savings and enhanced social and economic reputation.

Intergovernmental Panel on Climate Change – Established in 1988 by the World Meteorological Organization and the United Nations Environment Programme, the IPCC surveys peer reviewed scientific and technical literature and periodically publishes assessment reports on the latest scientific evidence. These reports are approved by 192 governments party to the United Nations Framework Convention on Climate Change and widely recognized as the most authoritative source of information on climate change.

Kyoto Protocol – An international treaty that sets legally binding targets for the reduction of GHG emissions by industrialized countries in the period 2008-2012. Canada ratified the Protocol on December 17, 2002, committing to reduce its GHG emissions by six per cent below 1990 levels by 2012. The Protocol entered into force internationally on February 16, 2005. Australia ratified Kyoto in December 2007, leaving the United States as the only major industrialized nation that has not ratified the agreement. There are currently 193 parties that have ratified the Protcol.

Mitigation – Actions taken by individuals and businesses to reduce their GHG emissions in order to minimize their effects on global climate change. Such actions may be taken in conjunction with national and international policies that seek to reduce GHG emissions.

Offset credits – See Emissions Trading.

Renewable Energy – Sources of energy which are inherently self–renewing, such as hydro, solar, wind, tidal and geothermal energy.

United Nations Framework Convention on Climate Change – An international treaty signed at the 1992 Earth Summit in Rio de Janeiro that established the "ultimate objective" for action to tackle climate change, namely, to stabilize "…greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic [human-induced] interference with the climate system." The Convention included a non-binding commitment for all developed countries to return their emissions to 1990 levels by the year 2000. Canada ratified the Convention on December 4, 1992 and the Convention came into force in March 1994. There are currently 195 parties that have ratified the Convention, including the U.S..

ANNEX 2: GREENHOUSE GAS EMISSIONS IN CANADA

Jurisdiction	Emissions (Mt)			Per capita emissions		Emissions Intensity (Emissions/$B real GDP/Mt)		2020 Provincial-Territorial "Equivalent" Targets (Mt)	
	1990[1]	2009	% Change	1990[1]	2009	1990[1]	2009	10 % below 1990 (NEG-ECP)[2]	17 % below 2005 (Federal)[3]
Canada (total)	590.0	690.0	16.9%	21.3	20.5	0.71	0.54		606.7
Newfoundland & Labrador	9.2	9.5	2.7%	16.0	18.6	0.79	0.52	8.3	8.3
Prince Edward Island	2.0	1.9	-3.6%	15.0	13.4	0.73	0.45	1.8	1.9
Nova Scotia	19.0	21.0	10.5%	20.9	22.4	0.92	0.73	17.1	18.5
New Brunswick	16.0	18.4	15.0%	21.6	24.6	1.01	0.79	14.4	18.1
Quebec	83.2	81.7	-1.8%	11.9	10.4	0.45	0.31	74.9	71.3
Ontario	177.0	165.0	-6.8%	17.2	12.6	0.53	0.32		167.7
Manitoba	18.5	20.3	9.7%	16.7	16.6	0.62	0.48		17.3
Saskatchewan	43.3	73.1	68.8%	43.0	71.0	1.56	1.84		59.2
Alberta	171.0	234.0	36.8%	67.1	63.7	1.73	1.31		191.7
British Columbia	49.8	63.8	28.1%	15.1	14.3	0.49	0.39		52.0
Territories (combined)	2.1	1.9	-9.4%	23.8	17.1	0.58	0.32		1.8

Source: Calculated from Statistics Canada and Environment Canada.

Notes:

1. 1990 is used as the base year in the table as it is the base year for the Kyoto Protocol.
2. The NEG-ECP target is a regional target and applies to the New England States, the Atlantic provinces and Quebec as a region. The figures shown represent what the "equivalent" emissions would be if applied on a provincial-territorial basis. Numbers do not add due to rounding.
3. The federal target is a national level target as set out in the Copenhagen Accord. It is contingent on the target to be established by the United States. The figures shown represent what the "equivalent" emissions would be if applied on a provincial-territorial basis. Numbers do not add due to rounding.

ANNEX 3: GREENHOUSE GAS REDUCTION TARGETS IN CANADA

Jurisdiction	Short-Term	Medium Term	Long Term
Canada (Federal Government)	–	17% below 2005 by 2020	–
Newfoundland and Labrador	1990 levels by 2010	10% below 1990 by 2020	75 - 85% below 2001 by 2050
Nova Scotia	Halfway to 2020 target by 2015	10% below 1990 by 2020	Up to 80% below 2009 levels by 2050
Prince Edward Island	1990 levels by 2010	10% below 1990 by 2020	75 - 85% below 2001 by 2050
New Brunswick	1990 levels by 2012	10% below 1990 by 2020	75 - 85% below 2001 by 2050
Quebec	6% below 1990 by 2012	20% below 1990 by 2020	75-85% below 2001 by 2050
Ontario	6% below 1990 by 2014	15% below 1990 by 2020	80% below 1990 by 2050
Manitoba	6% below 1990 by 2012	-	-
Saskatchewan	-	20% below 2006 by 2020	-
Alberta	20Mt below business as usual (BAU) by 2010	50Mt below BAU by 2020	200Mt below BAU by 2050 Equates to 14% below 2005 levels by 2050
British Columbia	6% below 2007 levels by 2012 18% below 2007 by 2016	33% below 2007 levels by 2020	80% below 2007 by 2050
Yukon	Stabilize by 2010 (Government emissions only)	15% below 2010 by 2015 (Government emissions only)	-
Northwest Territories	10% below 2001 by 2011 (Government emissions only)	-	-
Nunavut	-	-	-

Source: Federal, provincial and territorial climate change information

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